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Research and Practice for
Persons with Severe Disabilities

Contents

Exchange

Literacy Instruction in General Education Settings: A Call to Action 135
Samantha Gross Toews and Jennifer A. Kurth

Invited Commentaries

Literacy Instruction for All Students Within General Education Settings 143
Susan R. Copeland and Elizabeth B. Keefe

Implementing Comprehensive Early Literacy Instruction in General Education Classrooms: A Response to Toews and Kurth's Call to Action 147
Pam Hunt

Articles

"What I Want to Do as a Father Is Be There": Constructions of School Involvement for Fathers of Children with Complex Disabilities 153
Nadya Pancsofar, Jerry G. Petroff, Shridevi Rao, and Alyssa Mangel

Addressing Feeding Disorders Using High-Probability Sequencing for Children and Adolescents with Developmental Disabilities 169
Seth King, Hayley E. Johnson, Taneal Burch, and Argnue Chitiyo

Exploring Predictors of Community Participation Among Young Adults with Severe Disabilities 186
Hyunjoo Lee and Mary E. Morningstar

Editor Search 200

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Literacy Instruction in General Education Settings: A Call to Action

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Abstract

While legislation and research have promoted inclusive education and the importance of literacy instruction for students with extensive support needs, the majority of literacy instruction research continues to occur in separate self-contained special education settings. This article is a call to action to the educational research community to elicit research on literacy instruction strategies, including collaborative planning, teaching, and material preparation related to grade-level general education curriculum in general education school settings. Findings from current research on literacy instruction in separate special education and general education settings are presented. Suggestions for future research and action are discussed.

Keywords

inclusion, literacy, severe disabilities, extensive support needs, collaboration, research

Few skills affect as many aspects of modern life as literacy, making literacy one of the most important life skills to address for all students, including students with extensive support needs. Literacy, which includes listening, speaking, and interacting as well as reading, writing, and spelling, is a valued skill and fundamental human right for all people (Downing, 2007; Keefe & Copeland, 2011). Literacy enhances and creates opportunities for students to interact in their home, community, and school environments, as well as to engage within established adult roles, such as employment (Cihak, Wright, Smith, McMahon, & Kraiss, 2015; Ruppar, Afacan, Yang, & Pickett, 2017).

In the past 40 years, legislation has promoted access to improved literacy instruction for all students in general education settings. The Individuals with Disabilities Education Improvement Act (IDEA, 2004), mandates access to a free and appropriate public education for all students, including those with extensive support needs. Students with extensive support needs comprise the 1% of students with the most extensive needs for support who are eligible to complete their state's alternate assessment, and historically have experienced limited access to quality literacy instruction (Downing, 2007). IDEA also requires education in the least restrictive environment with the supplementary aids and services necessary for all students to succeed. In addition, the Every Student Succeeds Act (ESSA, 2015) and the Supreme Court's decision in the case of *Endrew F. v. Douglas County School District* (*Endrew F*, 2017) require that all students make progress toward grade-level standards and appropriately ambitious goals. Together, IDEA, ESSA, and *Endrew F* have compelled an increase in research on literacy instruction for students with extensive support needs.

While a base of research has emerged on effective literacy instruction for students with extensive support needs, this research has been conducted largely in separate self-contained special education classrooms,

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rather than in general education classrooms (Roberts, Leko, & Wilkerson, 2013). Thus, a significant gap exists between the empirical research and mandated services, with a resultant critical need to identify effective literacy instructional practices in general education settings for students with extensive support needs (IDEA, 2004; Kleinert et al., 2015; Sauer & Jorgensen, 2016). This persistent lack of research on literacy instruction in general education settings has left teacher preparation faculty, teachers, inclusive education advocates, and the research community with few evidence-based practices to recommend (Hudson & Browder, 2014; Ruppar et al., 2017). A strong base of research on literacy instruction in inclusive settings is urgently needed to provide the field of education with knowledge that can lead to quality literacy instruction for students with extensive support needs. This research is particularly needed with students who communicate nonverbally or through augmentative or alternative modes (Downing, 2005). The following call to action will first describe the existing research on literacy instruction conducted in separate self-contained and general education settings and then provide specific suggestions for future research.

Literacy Instruction for Students with Extensive Support Needs: A Problematic Past

Antiquated reading readiness and functional literacy approaches to education have been a barrier to quality literacy instruction for students with extensive support needs (Keefe & Copeland, 2011; Kliewer et al., 2004). These instructional approaches historically have precluded students from comprehensive literacy instruction until they master specific prereading skills (Afacan, Wilkerson, & Ruppar, 2018; Mirenda, 2003). The popularity of these instructional approaches has prevented children with extensive support needs from receiving explicit instruction in the multiple areas of literacy (e.g., comprehension, phonics, vocabulary), as they often struggle to master so-called prerequisite skills, such as phonemic awareness (Afacan et al., 2018). Consequently, students with extensive support needs are most often provided instruction on "functional" literacy skills with a heavy focus on sight word and vocabulary related to activities of daily living and community safety (Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzine, 2006; Kliewer et al., 2004). Such narrow, functional approaches to literacy instruction do not provide a learning environment rich in opportunities to engage with and communicate about text (Courtade, Lingo, & Whitney, 2013).

Research on literacy instruction has demonstrated the inadequacy of the reading readiness and functional reading approaches, in that they fail to account for the breadth of literacy skills students with extensive support needs can learn when provided with quality comprehensive literacy instruction (Afacan et al., 2018). The National Reading Panel, a multidisciplinary group created by the U.S. Congress to identify effective approaches to teaching reading to students, has identified five central components of reading instruction: phonics, phonemic awareness, fluency, vocabulary, and reading comprehension (National Institute of Child Health and Human Development, 2000). Based on their findings, a quality, comprehensive, literacy instructional program must include instruction in each of these components. Comprehensive literacy instruction integrates multiple components of literacy within meaningful instructional activities and interactions with text rather than isolated, single component skill instruction (Allor, Mathes, Roberts, & Champlin, 2010). From these findings, the emergent literacy perspective (Sulzby & Teale, 1985; Sénéchal, LeFevre, Smith-Chant, & Colton, 2001) and the importance of multicomponent literacy instruction have become more prevalent, resulting in increased access to effective literacy instruction for students with extensive support needs (Afacan et al., 2018; Allor et al., 2010; Browder, Ahlgrim-Delzell, Flowers, & Baker, 2012). Researchers examining emergent literacy have described how reading, writing, and speaking develop simultaneously and are influenced by the learner's surroundings (Justice & Pullen, 2003). This constructivist learning approach has prompted the research community and teachers alike to create learning environments rich in text, writing, and language to provide students with more opportunities to develop strong literacy skills (Rohde, 2015; Sulzby & Teale, 1985).

While the findings of the National Reading Panel (National Institute of Child Health and Human Development, 2000) are not specifically directed toward reading instruction for students with extensive support needs, their recommendations frequently are referenced when describing literacy interventions for this population (e.g., Browder, Root, Wood, & Allison, 2017). Comprehensive literacy instruction for all

students should include concurrent, systematic instruction in each of the literacy components identified by the National Reading Panel using evidence-based instructional strategies (Allor et al., 2010). Some research-based literacy strategies for students with extensive support needs include (a) time delay and systematic prompting (Browder et al., 2006), (b) shared story reading (Hudson & Test, 2011), (c) repeated reading (Hua et al., 2012), (d) graphic organizers (Browder et al., 2017), and (e) adapted age appropriate texts (Kurth & Keegan, 2014). Contemporary research has established support for multicomponent literacy instruction for students with extensive support needs (Afacan et al., 2018).

The Problem: Lack of Literacy Research Conducted in Inclusive Settings

While research has identified the importance of comprehensive literacy instruction for students with extensive support needs (Allor et al., 2010; Browder et al., 2012), there remains a need to investigate its efficacy in general education settings (Afacan et al., 2018), given the established benefits of inclusive education for students with extensive support needs. For example, researchers have associated inclusive education with (a) higher learning expectations; (b) increased engagement, participation, social interactions, and access to general education curriculum; (c) and improved academic, communication, and social skills (Ruppar, Fisher, Olson, & Orlando, 2018; Sauer & Jorgensen, 2016). Inclusive service delivery also has been shown to improve adult outcomes, such as postsecondary education, employment, and general independence (Ryndak, Alper, Hughes, & McDonnell, 2012). While some argue that a separate self-contained setting is necessary to provide effective individualized supports to students with extensive support needs (see Fuchs & Fuchs, 1994; Kauffman & Badar, 2016), empirical research consistently has shown students with extensive support needs can acquire higher levels of academic skills, including literacy skills, in general education settings (de Graaf & van Hove, 2015; Dessemontet, Bless, & Morin, 2012). In addition, students with extensive support needs served in general education settings are 10 times more likely to be exposed to academic literacy instruction than students in separate self-contained special education settings (Ruppar et al., 2018). Buckley, Bird, Sacks, and Archer (2006) conducted a comparative study of adolescents with Down syndrome taught in special education schools and in general education classrooms. Their findings indicate higher growth in expressive language and literacy skills for students educated in general education classes than those in special education schools. The demonstrated benefits of inclusive education on progress in literacy skills and access to instruction as well as instruction on the general education curriculum should be a significant prompt for increased research on literacy instruction in general education settings (Browder et al., 2017; Mims, Hudson, & Browder, 2012).

Responding to this need for improved research on inclusive instructional practices, researchers have identified strategies for implementing literacy instruction in general education settings. For example, embedded instruction (i.e., providing targeted instruction within the typical classroom routines) has been investigated to support literacy instruction in general education settings (see Johnson & McDonnell, 2004). Other research-based inclusive strategies include embedding (a) adapted general education materials to support acquisition and use of literacy skills (Copeland, Hughes, Agran, Wehmeyer, & Fowler, 2002), (b) shared story reading (Courtade et al., 2013), and (c) time delay (Ruppar et al., 2017). While research is beginning to inform teachers about embedding effective literacy instruction into general education settings for students with extensive support needs, a great deal more research is needed to firmly establish evidence-based practices. For this reason, we call on the research community to commit to the exploration of effective literacy instruction in general education settings for all students, especially for students with extensive support needs.

A Call to Action

Although research in the past several years has identified effective literacy instruction for students with extensive support needs, the setting of this research has remained primarily in self-contained special education classrooms. Considering the positive impact of inclusive education on outcomes for students with extensive support needs, their need for effective literacy instruction, and the emerging strategies

for teaching students with extensive support needs in general education settings, an urgent need exists to identify strategies for providing multicomponent literacy instruction to students with extensive support needs in general education settings.

We propose two broad research areas that need to be examined to generate a body of research on inclusive literacy instruction that is useful to practitioners. First, there is a need to expand on what we know already about effective and promising practices for promoting literacy skill acquisition for students with extensive support needs when they are in general education classes. Second and finally, there is a need for a body of evidence on how teachers can plan for and design effective literacy instruction for students with extensive support needs in ways that are consistent with the themes, lessons, and activities occurring within general education classes. These are described in more detail within the subsequent sections.

Building a Research Base for Inclusive Literacy Instruction Classroom Practices

A synthesis of recent literature on effective literacy instruction for K-12 students with extensive support needs including a focus on instruction within general education settings is needed to provide the field with clear directions for future research by identifying evidence-based and promising practices as well as identifying gaps in the research. This literature review should identify the characteristics of effective literacy instruction for students with extensive support needs, including a description of the setting variables such as instructional practices, interventionists, instructional content, student engagement, and student outcomes. The last published comprehensive review of literacy instructional strategies for K-12 students with extensive support needs was in 2006 (Browder et al., 2006). While more recent literature reviews exist on specific instructional strategies and interventions (Browder, Ahlgrim-Delzell, Spooner, Mims, & Baker, 2009; Hudson & Test, 2011), age groups (Copeland, McCord, & Kruger, 2016; Roberts et al., 2013), single components of literacy instruction (Hill, 2016; Joseph & Konrad, 2009), and multicomponent literacy instruction (Afacan et al., 2018), a broad contemporary literature review would provide directions for future research by identifying (a) instructional strategies that have had promising results in general education settings and that need further research to be considered evidence-based and (b) instructional strategies that have not yet been investigated in general education settings.

There is an urgent need to determine if, and how, evidence- or research-based practices determined to be effective in separate self-contained settings could be used or altered to be effective in general education settings. Such interventions might include shared reading (Hudson & Test, 2011); prompting methods, such as time delay (Mims et al., 2012); modified general education texts (Mims et al., 2012; Roberts & Leko, 2013); task analysis for instruction (Browder, Lee, & Mims, 2011); and peer assisted learning (Carter, 2017; Mastropieri et al., 2001). While these and other instructional strategies have a research base that supports their implementation in separate self-contained settings, they might need to be adapted to be effective in general education environments. The extent of such adaptations is not clear, however, without research occurring in general education settings.

It is particularly important that future research on literacy instruction in general education settings include students with extensive support needs who also have complex communication needs. Students with complex communication needs are students who communicate nonverbally or through the use of high-tech, low-tech, or no-tech augmentative and alternative communication devices (Beukelman & Mirenda, 2013; Orlando & Scherba de Valenzuela, 2018). This group of students is at increased risk of being educated in separate self-contained settings and denied access to comprehensive literacy instruction, with teachers reporting that they lack the knowledge necessary to make general education literacy content accessible to their students with more intensive communication support needs (Machalicek et al., 2010; Ruppar, Dymond, & Gaffney, 2011). Barriers to inclusive literacy instruction for students with extensive support needs who have complex communication needs may be addressed by increasing the knowledge of effective literacy instruction practices for this population through high-quality research (Downing, 2005; Zascavage & Keefe, 2004).

Building a Research Base for Planning and Preparation for Inclusive Literacy Instruction

Efficient planning and preparation for literacy instruction in general education is required to provide guidance for teachers who are struggling to implement literacy instruction in general education settings that include students with extensive support needs. Barriers that special education teachers have shared include the lack of time, willingness, and knowledge to collaborate for, plan, and prepare materials for effective literacy instruction in general education settings (Matzen, Ryndak, & Nakao, 2010; Roberts et al., 2013; Ruppar et al., 2011). Research is needed to systematically investigate and address each of these identified barriers. The importance of general and special education teacher collaboration has been documented (Agran, Alper, & Wehmeyer, 2002; Leko, Brownell, Sindelar, & Kiely, 2015). However, there are few systematic studies that investigate collaborative planning and material preparation strategies (Kurth & Keegan, 2014; Mastropieri & Scruggs, 2001). Research addressing these barriers might promote planning and preparation strategies that facilitate multicomponent literacy instruction in general education settings.

There is also a need for research implemented by teachers rather than researchers to ensure that an intervention could be easily implemented by a typical special or general educator. Teacher-implemented research would support efforts to ensure interventions have social validity, assuring that teachers feel they have the time and resources to prepare for and implement specific multicomponent literacy instruction in general education settings for students with extensive support needs. While research on multicomponent literacy interventions that are implemented by teachers with the presence of a researcher for data collection are vulnerable to teacher adaptation (i.e., the Hawthorn Effect; Ledford, Lane, & Gast, 2018), researchers can minimize the effect of an outside research team on student and teacher behavior by promoting school staff as primary interventionists and data collectors. Such designs would be a true test of the social validity of interventions and support teachers to engage in data collection that drives their instruction.

Conclusion

This call to action highlights areas of research that are needed to improve knowledge about literacy instruction in general education settings for students with extensive support needs. It is imperative that the research community identify evidence-based methods for embedding multicomponent literacy instruction in general education settings for students with extensive support needs and that this research is embedded in both pre- and in-service teacher development efforts if we are to ensure the provision of efficacious literacy instruction for all students.

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Literacy Instruction for All Students Within General Education Settings

Susan R. Copeland[1] and Elizabeth B. Keefe[1]

Keywords
literacy, inclusion, general education settings, students with extensive support needs

Literacy skills are among the most consequential skills someone can learn. Literacy supports every aspect of daily life, from learning new academic knowledge to active citizenship to finding and maintaining employment, not to mention the satisfaction and pleasure that can be experienced through using literacy to participate in leisure and recreation. Recognizing the vital nature of literacy, Toews and Kurth (2019) call not only for increased effort in teaching literacy skills to all students but that instruction occurs in general education settings. As the authors note, most of the research on literacy instruction for students with extensive support needs has been done in separate segregated special education classrooms. This prior research has documented that students with extensive support needs can acquire literacy skills, thus challenging the low expectations often held by educators and others in the field. This is especially true when the definition of literacy is broadened beyond conventional print-based literacy. These findings are important and establish a foundation upon which researchers and practitioners can build and improve instruction and teacher preparation. Research has also established that comprehensive literacy instruction—concurrent instruction in all the core components of reading—rather than teaching discrete skills in isolation, is most effective for students with extensive support needs. Research has not yet, however, produced well-tested instructional models that practitioners can utilize to provide literacy instruction effectively within general education settings.

Literacy Instruction in General Education Settings

If effective instructional practices, delivered in separate special education classrooms, work—if they result in students with extensive support needs acquiring important literacy skills—why does it matter where this instruction takes place? Toews and Kurth (2019) insist that the instructional setting does matter. They highlight federal education law and recent case law that mandate that all students participate in and make progress in meeting grade level standards. They also emphasize the strong research base documenting positive academic outcomes for students who receive instruction alongside their general education peers. We agree that the context for instruction is crucial for many reasons. An often overlooked but fundamental aspect of literacy is its social nature; interactions with others are at the heart of literacy (Koppenhaver, n.d.; Morgan, Cuskelly, & Moni, 2011; Papen, 2016). Literacy acts often occur within the typical social interactions we have with others each day. Very young children, for example, engaging in pretend play will often "write" messages or labels for their play that, even though they may just be scribbles or letter strings, convey

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meaning to their play partners and advance their games. Older individuals daily engage in multiple literacy practices that convey meaning to others (e.g., texting, sending a birthday card to a friend). Even reading a book or online text involves an inner dialogue of sorts with the author of the text in an attempt to understand what is read. The social nature of literacy supports skill acquisition for students with extensive support needs who learn best when literacy instruction has authentic purposes, is embedded in meaningful activities, when there are peers present to model literacy skills, and when the students are part of a community of learners (Keefe, Copeland, Luckasson, & Ryndak, 2018). Teacher expectations and the resulting opportunities they provide students with extensive support needs to learn and practice literacy skills also appear critical in understanding the importance of context for literacy instruction. Toews and Kurth (2019) describe multiple studies that document this finding, including Ruppar, Fisher, Olson, and Orlando's (2018) startling finding that exposure to academic literacy for students with severe disabilities in general education classrooms was 10 times greater than for students in settings where students without disabilities were not present (e.g., self-contained classrooms).

We contend that literacy is a human right (Copeland, Keefe, & Luckasson, 2018; Keefe & Copeland, 2011), and findings showing that literacy instruction focused on academic knowledge is provided more frequently in inclusive settings than in separate segregated settings simply cannot be ignored. To do so perpetuates the long history of excluding students with extensive support needs from opportunities to engage in rigorous academic instruction and literacy environments (Copeland et al., 2018). Controlling who has access to literacy instruction has long been used to subjugate groups of people, and indeed, "people with extensive support needs represent the last group of people denied opportunities for literacy instruction" (Keefe & Copeland, 2011, p. 92). We welcome Toews and Kurth's (2019) call to the field for renewed efforts to reimagine how and where literacy learning opportunities are offered to students with extensive support needs.

Future Directions

Having established the efficacy of literacy instruction for students with extensive support needs, documented the critical nature of the context in which instruction takes place, and established the legal and legislative mandates supporting inclusive education, where does the field go from here? Toews and Kurth (2019) answer that question by calling for research investigating the application of practices substantiated as evidence-based in separate special education settings to general education settings. They also emphasize the need for development and evaluation of new literacy instructional practices within general education classrooms.

Classrooms are complex environments that place multiple, often competing, demands on educators. Researchers cannot deny the very real concerns of many educators about the "how-to" of including students with extensive support needs in literacy instruction within general education. Toews and Kurth (2019) respond to this concern by emphasizing that a central focus for future research is the development of practical, effective models for delivering literacy instruction for all students in a general education classroom. Instructional models must account for the barriers that exist (e.g., teachers' knowledge of evidence-based practices or low expectations of the learning potential of students with extensive support needs). This process should include teachers as research partners in the design and implementation of instructional models; interventions in much of the current research have been implemented by highly trained research assistants, not classroom teachers, and as Toews and Kurth (2019) note, this negatively affects the social validity of research outcomes. If educators are to embrace the call to include students with extensive support needs in literacy instruction within general education settings, teachers must know not just how to utilize instructional strategies but also feel confident in their abilities to plan and manage instruction. This necessitates instructional models that are a good contextual fit with general education learning environments.

Hunt et al. (2019) describes one example of how to design and implement rigorous research that involves educators in socially valid ways. She and her colleagues designed and implemented a randomized control trial study to examine systematic, comprehensive literacy instruction delivered in a small group format within general education classroom literacy blocks. Student participants had extensive support needs and a

substantial number did not use speech to communicate. Participants' special education teachers and paraeducators delivered the instruction in general education settings after receiving training on the program used (*Early Literacy Skill Builders*; Browder, Ahlgrim-Delzell, Courtade, Gibbs, & Flowers, 2008). An essential component of the model was including reading buddies, typically developing peers in the same grade, as part of the four students in each small group. This format capitalizes on the social nature of literacy and provided strong models of what Kliewer calls "literate citizenship" (Kliewer, 2008) for the children with extensive support needs. Results indicated that students with extensive support needs in the treatment group made significant increases in skills across time, and their scores on standardized and researcher-developed literacy measures were higher on all measures than students in the control group, with the exception of vocabulary skills which were similar across groups.

Although Hunt et al. (2019) designed a model of instruction that accounts for many of the potential pitfalls that might occur in implementing literacy instruction in general education classrooms and included a qualitative study to examine the social validity of the model from the perspective of the educators, school administrators, and reading buddies, they acknowledged that only 4% of their participants actually received the majority of their education within general education classrooms. This underscores the need for Toews and Kurth's (2019) call to action: Most children with extensive needs for support are not currently authentic members of general education classrooms (e.g., Ryndak et al., 2014) and, based on current research findings, are therefore not receiving the rigorous, appropriate literacy education that can lead to positive outcomes and meaningful participation in the literate community (e.g., Ruppar, 2015).

We would add two additional critical aspects that must be considered to address the call to action by Toews and Kurth (2019). First, influencing and educating policymakers, administrators, and other educational leaders about literacy instruction for students with extensive needs for support must be addressed as a critical element of the context of future research investigating inclusive literacy practices. Parents and families are part of this broader context, and we need them to respond with targeted advocacy on behalf of their children with extensive support needs, to heed this call to action, and support a change in the location and models of literacy instruction. Without their support for systems change, it is unlikely that sustained changes in policies and funding needed to facilitate inclusive literacy instruction across districts and states will occur. Second, general and special teacher educators must respond by making changes to preservice and inservice teachers' preparation to equip them with the pedagogical skills, dispositions, and experiential learning opportunities to provide *all* students effective literacy instruction within general education classrooms.

Conclusion

Toews and Kurth (2019) have challenged researchers and educational practitioners to take what has been learned about literacy instruction for students with extensive support needs and apply it within general education environments. This represents a much-needed step to maximize what we know about the importance of context in facilitating learning. Achieving this goal will not be simple nor will it occur quickly, given the complexity of school environments and the long history of denying these learners access to equitable learning environments. Changes in the opportunities offered and outcomes experienced by students with extensive support needs is possible and we strongly support this call to move forward.

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Implementing Comprehensive Early Literacy Instruction in General Education Classrooms: A Response to Toews and Kurth's Call to Action

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Keywords
early literacy interventions, general education classrooms, students with extensive support needs

Toews and Kurth (2019) provide convincing arguments to support their call to action. Their appeal is for research addressing *comprehensive literacy instruction* for students with extensive support needs that is implemented in general education classrooms. To date, there are no studies addressing this need. We do have an emerging body of research evaluating the effectiveness of multi-component early literacy interventions designed for this population of students (e.g., Allor, Mathes, Roberts, Jones, & Champlin, 2010; Bradford, Shippen, Alberto, Houchins, & Flores, 2006; Browder, Ahlgrim-Delzell, Flowers, & Baker, 2012; Lemons, Mrachko, Kostewicz, & Paterra, 2012; Whalon, Otaiba, & Delano, 2009). However, as Toews and Kurth (2019) point out, these studies were conducted in separate settings. We also have a group of literacy studies that were implemented in general education settings (e.g., Collins, Evans, Creech-Galloway, Karl, & Miller, 2007; Hudson & Browder, 2014; Ruppar, Afracan, Yang, & Pickett, 2017). However, this research is limited to investigations of components of literacy instruction, rather than comprehensive courses of instruction that address the literacy skill areas identified by the National Reading Panel (NRP) Report (National Institute of Child Health and Human Development [NICHD], 2000) as building blocks for beginning reading—phonological awareness, phonics, comprehension, vocabulary, and fluency. I propose that through the unification of these separately developing lines of research, we can accomplish the desired outcome of Toews and Kurth's (2019) call to action. To that end, investigations incorporating both comprehensive, research-based literacy instruction *and* inclusive instructional contexts could be designed as replication-extension studies (Bonett, 2012; Coyne, Cook, & Therrien, 2016; Doabler et al., 2016). These conceptual replication studies would give researchers the freedom to explore various inclusive contextual models for implementing comprehensive early literacy instruction while maintaining intervention fidelity.

An Example

During the 2016-2017 school year, Elizabeth Kozleski and I, with members of our research teams, conducted such an investigation. Our study, funded by the Institute of Education Sciences, was designed to replicate a comprehensive emergent literacy program developed for students with extensive support

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needs and to extend that research to small, integrated group contexts in general education settings (Hunt et al., 2019). We chose *Early Literacy Skills Builder* (ELSB; Browder, Ahlgrim-Delzell, Courtade, Gibbs, & Flowers, 2008; Browder et al., 2012) as our literacy intervention. ELSB was selected because it draws on the NRP Report (NICHD, 2000) to include both code and meaning-focused skills while using instructional methods and systematic prompting procedures found to be effective with students with severe disabilities, including students who are nonverbal responders (Browder, Ahlgrim-Delzell, Spooner, Mims, & Baker, 2009). In addition to lessons addressing phonological awareness, phonics, vocabulary, and comprehension, it includes a shared story-reading component using literature from the students' grade level to teach the children to interact with books in addition to developing comprehension and vocabulary skills.

Although the results of the studies conducted by Browder and her colleagues (Browder et al., 2008; Browder et al., 2012) to investigate the effects of ELSB instruction on the emergent reading performance of students with extensive support needs are promising, the instructional settings for those studies were limited to special education classrooms. By conducting efficacy trials in separate settings only, practitioners and policy makers may conclude that special education classrooms are the only places where students can receive instruction that is systematic and comprehensive and which cannot easily be distributed and embedded in the context of ongoing literacy instruction in general education classrooms.

The purpose of our conceptual replication study was to evaluate the effects of ELSB instruction on the early literacy performance of students with extensive support needs when it was implemented in general education classrooms in small group contexts with peers participating in the lessons as "reading buddies." The randomized controlled trial (RCT) was conducted in 16 schools in three states. Eighty students with extensive support needs participated in the study (4-8 students per school site). The students were eligible to take alternate assessments, enrolled in Grades K-4, read below the first grade-level, had picture discrimination skills, and were able to sit for short periods of time for instruction. Twenty-four students who were nonverbal responders participated in the study. The eligible students at each school site were matched into pairs for each teacher based on their disability diagnosis, verbal status, gender, and grade. One student from each matched pair was randomly assigned to the intervention group (ELSB instruction), and the other student was assigned to the control group ("business-as-usual" instruction; BAU).

Instruction for both groups of students was implemented in general education classrooms by special educators during the classroom's literacy block. The majority of the students were mainstreamed into general education classrooms for the literacy lessons, although a small number of the students (4%) were full-time members of the class. The daily lessons were 30 to 40 minutes in length. All 80 students were assigned a general education peer as a reading partner. On the average, 66% of the students in each class volunteered to be reading buddies. The opportunity for the general education students to serve in this role was rotated through the list of volunteers. Reading buddies participated with their partner in the literacy lessons. They did not take a "tutor" role; however, they did serve as proficient models of the targeted reading skills, thereby providing repeated opportunities for observational learning by the focal students (Bandura, 1977; Bandura, 1986).

ELSB lessons were implemented in small, integrated group contexts (typically, two students with extensive support needs and two reading buddies). The majority of BAU instruction was also implemented in small, integrated groups; although in some classrooms, BAU instruction was delivered through whole-class lessons with adapted materials and support from special educators and peers or a combination of whole class and small group lessons. These integrated group contexts for students in both groups capitalized on the potential for observational learning through peer modeling of targeted literacy skills. Special education teachers and paraprofessionals partnered to teach the lessons on a rotating basis. General education teachers managed the calendar that identified the reading buddy for each day and collaborated with the special education teacher to determine the way in which ELSB and BAU instruction would be physically integrated into the classroom space and ongoing classroom activities.

ELSB small group lessons to teach phonological awareness, phonics, vocabulary, and comprehension focused on stories from a book about a frog named Moe. A frog puppet was used during the lessons

to motivate the students to attend and participate. Systematic prompting procedures (constant time delay), correction, and reinforcement procedures were used. The direct instruction method of model, lead, and test was embedded within the lesson framework. Lessons were repeated as needed for students to begin making independent responses. These lessons alternated each day with the shared story-reading component of ELSB. During shared reading lessons, students were taught the conventions of reading and text awareness, comprehension, and vocabulary skills. Adapted grade-level books were used, with general education teachers recommending books that were popular among students at that grade level and books currently included in the classroom's literacy activities.

The BAU lessons were designed by the special education teachers to meet the participating students' literacy goals. An analysis of the characteristics of that instruction is currently underway. Preliminary analyses reveal that the majority of the lessons were "teacher designed" and addressed individual components of early literacy instruction (e.g., letter names and sounds or listening comprehension taught in a shared reading context), rather than the full range of early literacy skills.

Replicating with Fidelity

Efforts were made to promote high levels of fidelity of ELSB implementation for this replication study. Research team members were certified in ELSB implementation by members of the research team who developed and evaluated the ELSB program. Following their certification, they conducted a 2-day ELSB training for participating special education teachers during the summer, with a "booster" session scheduled close to the start of the school year. Finally, after the onset of the study in early September, research team members ("school site coordinators") observed literacy lessons implemented each week across school sites and provided corrective feedback if needed. Their observations were guided by a detailed fidelity checklist documenting the level of accuracy of implementation of each instructional step. These efforts produced an average fidelity score across school sites of 95.1%. Interobserver agreement measures, collected during 22.4% of the fidelity sessions, showed 96.2% agreement between the independent observer and the primary fidelity data collector.

Promising Results

Literacy data were gathered in five waves scheduled across the school year. The two literacy measures were the Gates–MacGinitie Reading Test (4th ed.), Pre-Reading Level (GMRT; MacGinitie, MacGinitie, Maria, & Dreyer, 2000) and the Nonverbal Literacy Assessment (NVLA; Baker, Spooner, Flowers, Ahlgrim-Delzell, & Browder, 2010). Data analysis procedures included hierarchical linear modeling (Raudenbush & Bryk, 2002; Singer & Willett, 2003) conducted separately for the GMRT score and NVLA total score and subtest scores. The models estimated overall group difference across time and group difference in change over time. In addition, independent-sample *t* tests were performed to identify specific measurement times where the group differences were significant.

The results of the study were promising. They showed that assessment scores for students in both the ELSB group and the BAU group showed a significant increase in each of the two literacy measures over the school year when the students' literacy instruction was implemented in general education classrooms. However, we did find that scores for students receiving ELSB instruction showed greater gains as compared to those of students in the BAU control group. The one exception to this was the finding for the NVLA subtest, Vocabulary/Word Study. For this subtest, scores for both groups showed a significant increase over time; however, there was no difference between the groups. This finding suggests that both ELSB and BAU instruction promoted vocabulary development as measure by the NVLA. The moderate effect sizes for our study were promising, particularly given the targeted population of students. Effect sizes at 9 months were .49 for the total GMRT score and .55 for the total NVLA score. Effect sizes for the NVLA subtests ranged from .48 to .69, with the largest effect size found for measures of comprehension. These effect sizes were stronger than those reported by the Browder et al. (2012) study (i.e., .30-.49), although it is difficult to make comparisons between the studies because of the difference in control group interventions.

The Role of Social Validity Analyses in Replication-Extension Research in Inclusive Settings

Social validity studies serve an important role in understanding, from stakeholders' perspectives, the benefits associated with the intervention under investigation—as well as the cultural, ecological, and logistical obstacles that may affect the adoption, sustainability, and scaling up of the intervention (Kazdin, 1977; Lindo & Elleman, 2010; Wolf, 1978). To that end, we conducted a qualitative study—as a partner to our RCT—to examine the social validity of the intervention's goals, procedures, and outcomes from the perspective of participating general and special education teachers, principals, and reading buddies (Kazdin, 1977; Wolf, 1978). Focus groups and individual interviews were conducted to solicit stakeholders' perceptions of, their opinions about, and their experiences with the delivery of comprehensive early literacy instruction to the students with extensive support needs in general education classrooms. For example, we asked all interview participants to share their perspectives on the importance of teaching early literacy skills to students with extensive support needs and the importance of implementing that instruction in general education classrooms. We explored teachers' perceptions of their ability to implement the ELSB instructional procedures easily and effectively. We asked teachers and principals to discuss their perceptions of the logistical and ecological factors that facilitated or impeded the inclusion of the students with extensive support needs in general education classrooms for literacy instruction. Finally, we asked all participants to describe the degree to which they thought that focal students, their reading buddies, and adults in the general education classrooms benefited from their experiences.

The "intervention" for our RCT included not only a comprehensive early *literacy program* for students with extensive support needs (i.e., ELSB), but also a *model* for delivering that instruction in general education classrooms (i.e., a small group context with peers participating in the instruction as reading buddies). Participants' perspectives on the importance and acceptability of the intervention goals, procedures, and outcomes provided critical guidance for revising and refining the intervention to increase its adoptability and sustainability. When principals and teachers perceive that the intervention is important, teachers have confidence in their ability to implement systematic comprehensive literacy instruction in integrated, small group contexts, and peers find their participation as reading buddies enjoyable and worthwhile, the probability that the intervention will be adopted and sustained is much more likely. Stakeholder feedback provides critical guidance on how to improve the intervention to address obstacles and create a better fit with classroom and school culture and ecology.

Final Thoughts: Placement Makes a Difference

If inclusive models for delivering comprehensive literacy instruction are to be adopted, sustained, and scaled up, the issue of educational placement must be considered.

The majority of students with extensive support needs in the United States are placed in separate classrooms for the majority of the school day (National Center for Education Statistics, 2018). In our study, only four of the 80 students were members of general education classrooms and educated for the majority of the day in inclusive settings. Therefore, the reality is that models for delivering *comprehensive* literacy instruction in general education settings that can be widely replicated have to be built upon a mainstreaming version of inclusive education—and placement makes a difference.

When the special education teachers in our study were engaged in delivering comprehensive literacy instruction to students in general education classrooms, the education of the remaining students on the teachers' caseload could not be disrupted. Teachers and principals put plans into place so that educational activities continued under the supervision of qualified personnel. However, scheduling and staffing logistics and the teachers' concerns about "leaving their class behind" were challenges that focus group teachers and principals candidly discussed. They are also the realities that must be considered as the field responds to Toews and Kurth's (2019) call to action.

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"What I Want to Do as a Father Is Be There": Constructions of School Involvement for Fathers of Children with Complex Disabilities

Nadya Pancsofar[1], Jerry G. Petroff[1], Shridevi Rao[1], and Alyssa Mangel[1]

Abstract

Fathers of children with complex disabilities can play an important role in the development and learning of their children; however, very little is known about their school involvement experiences. We conducted semi-structured interviews with 15 fathers of children with complex disabilities to learn how these fathers perceived their involvement in their children's education and schooling. Fathers constructed their school involvement with a consideration of their work and co-parenting experiences. Their employment was perceived as a form of indirect involvement in their children's education, but could also be associated with barriers to more direct school involvement. Fathers also discussed the role of the co-parenting relationship in their school experiences and identified several factors that contributed to a greater involvement of mothers in school settings. Among these were a perceived unique expertise of mothers and school environments that were more welcoming to mothers. They also discussed some potentially negative ramifications of being less involved in school settings, compared with mothers.

Keywords

fathers, school involvement, home–school collaboration, autism, deafblindness

Over the past several decades, there has been an increase in research on father involvement in children's education and learning (Cabrera & Tamis-LeMonda, 2014; Lamb, 2010). Recent research has moved away from unidimensional characterizations of fathers that focused on father presence or absence to a broader consideration of the many roles fathers play in the developmental and educational experiences of their children (Lamb, 2010; Pancsofar, Vernon-Feagans, Odom, & The Family Life Project Investigators, 2013). However, this extant literature remains almost exclusively focused on fathers of typically developing children, while very few studies have considered the school involvement experiences of fathers of children with disabilities, and even fewer studies considering fathers of children with complex disabilities. For the purposes of this research, the term *complex disability* describes a set of developmental challenges that require highly specialized and unique supports. In addition, these individuals may present with an array of health-related challenges especially in the initial stages of human development. This population includes children assigned the label of deafblindness, severe-profound intellectual disabilities, and autism. Research on father involvement in the educational experiences of children with complex disabilities can inform the work of

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educators and related service personnel, highlighting avenues for intervention and collaborative family-centered partnerships. There is a critical need for research that considers not only how fathers of children with complex disabilities construct their involvement in their children's educational experiences but also how the school involvement experiences relate to other aspects of parenting and family life.

Fathers' School Involvement in Child Developmental and Educational Experiences

Parent–school involvement has long been heralded as a key component for student success (Olivos, Gallagher, & Aguilar, 2010). A focus on parent involvement and participation is consistently evidenced within educational policy and practice. In special education, parental involvement is a core concept within the Individuals with Disabilities Education Act (IDEA, 2004). IDEA requires local school districts provide opportunities for parents of students with disabilities to be equal partners in their children's education. IDEA mandates districts create access for parental involvement in all facets of the special education process, including assessment, program planning, program implementation, and placement. In an attempt to meet that charge, a rich literature base has been developed that reveals the importance of strong home–school partnerships and identifies supports that enable families to be active participants in the education of their child (Blue-Banning, Summers, Frankland, Lord Nelson, & Beegle, 2004; Goldman & Burke, 2017; Keilty, 2016).

The extant literature on fathers' school involvement has largely focused on the role of fathers of children without disabilities in general education settings. This research has shown that the benefits of fathers' school involvement for child educational attainment and student achievement in the areas of math and reading are additive and above and beyond the positive contributions of mothers' school involvement (Flouri & Buchanan, 2004; Kim & Hill, 2015; McBride, Schoppe-Sullivan, & Ho, 2005). Over the past few decades, research on fathers' roles in early development has been particularly robust, and numerous studies have found that father–child interactions are positively related to children's later development in areas such as language, literacy, math, social-emotional, and intellectual skills, as well as school achievement (Baker, 2013; Pancsofar & Vernon-Feagans, 2006; Pancsofar et al., 2013).

Although most of the research in this area has focused on children without disabilities, there has been some recent work examining how father–child interactions may positively influence the development of children with complex disabilities (Flippin & Crais, 2011). For example, Flippin and Watson (2015) found that fathers' verbal responsiveness to their children with autism spectrum disorder was associated with more advanced child language development. They speculated that father involvement in intervention efforts with children with complex disabilities may have an important positive impact on their later development and learning.

In one of the few studies to consider school involvement for fathers of children with disabilities, Mueller and Buckley (2014) found that fathers played several important roles in their children's education, as they partnered, advocated, and learned about the special education system. However, these fathers reported they often felt left out of the educational system and their child's team. Mueller and Buckley found that possible contributing factors for this alienation included mothers spending more time in schools and teachers' assumptions that mothers played dominant caregiving roles in the families. Fathers in this study also identified that most of their children's teachers were women. They perceived differences in communication styles used by men and women, and these factors contributed to them feeling left out of their child's educational team processes. Hart (2011) found similar barriers for fathers' school involvement, as fathers in this study describe feeling somewhat excluded from the context of schools that they perceived as "female-dominated" environments where mothers were expected to be the most common conduits of information between home and school. These barriers made it difficult for fathers to feel like valued members of the educational team.

Although the importance of fathers' involvement in the educational and learning experiences of children with disabilities is being increasingly recognized as a critical component of high-quality special education service delivery (Pancsofar, Petroff, & Lewis, 2017), the existing research on the school involvement

experiences of fathers of children with disabilities suggests that communication and collaboration between home and school often occur primarily with students' mothers, supplanting the equal participation of fathers (Carpenter & Towers, 2008; Hart, 2011; Mueller & Buckley, 2014). This focus on mothers as the first line of communication may result in fathers feeling excluded from their children's educational experiences and their eventually ceasing to participate altogether. For fathers of children with complex disabilities, this trend may be more pronounced due to the elevated needs of their children and services from an array of professionals within a variety of settings that can include home, school, hospitals, and clinics.

The extant literature on facilitating the participation of fathers of children with complex disabilities in their children's education identifies various barriers that fathers may face, including teacher assumptions of father disengagement and logistical challenges such as difficulty attending meetings and school events because of conflicts with work commitments (Carpenter & Towers, 2008; Mueller & Buckley, 2014). However, there is a need for a deeper understanding of how fathers of children with complex disabilities perceive their involvement in their children's educational settings and how fathers' school involvement is constructed within broader contexts of father work experiences and the mother-father co-parenting system. A better understanding of fathers' experiences may lead to increased knowledge about additional barriers to fathers' involvement in their children's education and recommendations for changes that would facilitate fathers' involvement.

Contextual Factors Shaping Father–School Involvement: Systems Theories

To fully understand the experiences of fathers of children with complex disabilities in their children's education and learning, it is important to consider the ways in which fathers' school involvement is situated within broader contexts and systems in which fathers live their lives. Ecological systems theory and family systems theory provide a basis for conceptualizing the nested and interrelated contexts in which father–school involvement can be understood (Bronfenbrenner, 1979; Minuchin, 1985). According to ecological systems theory, child development and learning occur within and is affected by a variety of contexts, which are organized as nested systems that include, from most proximal to most distal, the microsystem, mesosystem, exosystem, and macrosystem (Bronfenbrenner, 1986; Bronfenbrenner & Morris, 1998). The microsystem includes the settings within which children behave at given moments in their lives. Family and school contexts are important microsystems in understanding children's development and learning. The mesosystem includes the interactions and influences between the principal settings (microsystems) in which child development occurs. Parent–school interactions are a mesosystem context for child development and learning, which is, in turn, shaped by other contexts within and outside of the settings of the family and the school (Bronfenbrenner, 1986; Bronfenbrenner & Morris, 1998). One such context includes father work settings and experiences (Cabrera, Fitzgerald, Bradley, & Roggman, 2014). The very limited research in this area suggests that fathers of children with disabilities may struggle in balancing their working lives and their caregiving responsibilities, and that fathers may very rarely receive formal support in negotiating these responsibilities (Carpenter & Towers, 2008). In addition, fathers may not be available to attend school meetings and events that conflict with their work hours and job commitments (Carpenter & Towers, 2008; Hart, 2011).

Family systems theory further deepens the consideration of fathers' school involvement by highlighting the importance of the co-parenting system in shaping parenting experiences (Minuchin, 1985). According to this theory, families comprise smaller, independent subsystems, which influence one another. Characteristics of the co-parenting subsystem can support or stress the functioning of the parent-child subsystem (Pancsofar, Vernon-Feagans, Odom, & Roe, 2008). Fathers may construct their parenting roles, including their involvement in their child's educational experiences, with a consideration of their co-parenting relationship and associated roles. Characteristics and dynamics of the co-parenting relationship may be important factors in understanding how fathers are involved in schools and construct their roles in educational settings. In many families, mothers may be the main source of communication and information regarding their child's educational experiences (Pancsofar et al., 2017). Fathers may play an important

Table 1. Demographic Information About Father Participants (n = 15).

Demographics	n	%
Child disability		
Deafblind	11	73
Autism	4	27
Child age		
Early childhood (3-5 years)	2	13
School-aged (6-21 years)	12	80
Postschool-aged (older than 21 years)	1	7
Employment status		
Employed full-time	12	80
Retired	2	13
Stay-at-home parent	1	7
Marital status		
Married	14	93
Divorced	1	7
Race/ethnicity		
White	14	93
Latino	1	7

support role for their wives in caregiving and their children's education teams (Carpenter & Towers, 2008; Hart, 2011; Mueller & Buckley, 2014). Less is known about the ways in which fathers make sense of their role in their co-parenting partnership regarding school involvement and how characteristics of co-parenting relationships may shape this role for fathers.

This article describes research conducted to explore how fathers of children with complex disabilities construct their involvement in their children's education within their broader experiences in their work and family lives. The study explored the following research question: How do fathers of children with complex disabilities perceive their involvement in their children's education?

Method

This study used qualitative methodology to investigate fathers' construction of their involvement in their children's education. Qualitative interviews allowed for a focus on the fathers' own frames of reference in their school involvement.

Participants

Fathers were recruited to participate in this study through staff at a local technical assistance and research center for families of children with complex disabilities. Through this center, there was direct outreach by email and telephone calls to collaborating state deafblind projects and other associated professional organizations within the field of special education to share information about this study with fathers within their networks. Fathers who were willing and available to be interviewed gave permission for staff to share their contact information with researchers, who then contacted fathers by email to schedule the interview. All fathers who indicated interest in participating in the study were included; there were no fathers excluded from participating.

Table 1 presents demographic information about the 15 fathers who agreed to participate in the study. These fathers lived in several different states in the eastern part of the United States. The children of these fathers were primarily school age and had a range of disabilities that could be broadly categorized as complex and requiring extensive support needs. In total, 11 of the fathers had children with deafblindness, which for some was associated with Usher syndrome, Alström syndrome, or CHARGE syndrome. Most

fathers were married, employed, and White. Fathers worked in different fields, including government, military, managerial, construction, and legal professions. Mothers stayed home as the primary caregiver in about half of the families; mothers who worked outside of the home were employed in fields such as education, law, and finance.

Data Collection

Data were collected through individual semi-structured interviews with each father. Fathers were asked to provide oral consent prior to the commencement of their interview. Six of the interviews took place in person, and eight were conducted over the phone. In-person interviews were conducted at locations preferred by the fathers, which most often were the researchers' offices. Interviews lasted between 30 and 90 min, with an average time of approximately 1 hr. Interview protocol questions were broad and open-ended to allow for fathers to identify the key issues of salience in their own fathering experience. Example questions included, "What are your main priorities for your child's education?" and "What helps you to be involved in your child's education in the way that you would like to be?" All interview protocol questions were asked during each interview; however, interviews were not limited in scope to just the protocol questions, and protocol questions were not always asked in the same order. The interviews were conducted as guided conversations (Rubin & Rubin, 1995) in which fathers were encouraged to branch out beyond the scope of the protocol questions, and follow-up questions were used that encouraged depth and detail to the interview. All interviews were audio-recorded.

Data Analysis

Interviews were transcribed verbatim, yielding 257 single-spaced pages of transcription. Interview data were analyzed using open coding methods (Flick, 2014). The first and fourth author independently read and assigned codes to the first two transcripts. Codes in the form of words or short phrases representing summative and/or salient thoughts were assigned throughout transcripts of the participants' responses. One example of a participant-generated code was "A Different Picture," which was eventually merged with other codes from the data in which fathers highlighted "difference" or "uniqueness" in their experience fathering their children with complex disabilities. Other codes that emerged from the participants themselves included the following: "Mommies are best," "Tag team," and "Mom does a lot." After reviewing these open codes and discussing the procedures for coding the rest of the transcripts, six more transcripts were coded collaboratively by the first and fourth authors. Once agreement was reached on the meaning of the codes and coding process, the first author independently coded the last seven transcripts.

Coded data were analyzed using content analysis, which applied an inductive and iterative process in which codes were compared to identify conceptual categories and emerging themes (Glaser & Strauss, 1967; Hsiu-Fang & Shannon, 2005). In this iterative process, initial coding categories were compared and refined, and subcategories emerged that illustrated the factors involved in fathers' construction of their school involvement. For example, codes such as "I wish I was at school today," "You can't always take off work," and "70/30 meetings attended in person" were compared and combined with other similar codes to identify the conceptual category, "Work experiences as challenges to direct school involvement," which was considered with other conceptual categories related to father work experiences to form an emerging theme of "Father work experiences and school involvement." This iterative process yielded a set of final themes that are represented in the findings.

Member checks were conducted with one third of the participants. Member checks have been identified as one measure of quality and credibility of a qualitative study and the extent to which the analysis captures the perspectives of the participants (Brantlinger, Jimenez, Klingner, Pugach, & Richardson, 2005; Tracy, 2010). Similar to the approach used in other qualitative interview studies (see Mueller & Buckley, 2014), a subsample, including five of the interviewed fathers, was sent a summary of the findings and asked for feedback regarding the themes. These fathers lived in four different states and had children of different ages.

All fathers agreed with the findings. Trustworthiness of data analysis was further addressed through an interpretive community that included the second and third authors, who helped to develop themes and reviewed the coded data. Two of the authors were parents of children who received services through Individualized Education Programs (IEPs) or 504 plans, and the first three authors had more than 15 years each of professional experience working with children with disabilities. The researchers engaged in reflexivity throughout the research process by meeting frequently and reflecting on how the interview data and analysis intersected with their own professional and personal experiences.

Findings

Findings from this study show the following main themes related to the construction of school involvement for fathers of children with complex disabilities: (a) It's different than with your other kids: Constructing fathering of children with complex disabilities, (b) How do you balance that? Fathers' work experiences and school involvement, and (c) Tag team: Co-parenting relationships and fathers' school involvement. A fourth theme was identified that explored the intersections between fathers' work experiences and co-parenting relationships in their school involvement experiences.

It's Different Than with Your Other Kids: Constructing Fathering of Children with Complex Disabilities

Fathers who were interviewed situated their roles in their child's education within the framework of parenting a child with complex disabilities. Many fathers articulated that there may be something unique about the stress felt by fathers of children with complex disabilities, and as Jeremy said, "It takes a while to deal with because it's different than with your other kids." Fathers suggested that it would be important for professionals to understand this perspective. For example, Owen, whose daughter has CHARGE syndrome, described the complex medical needs his daughter experienced during her first years of life, including issues with her kidney, reflux, cardiac abnormalities, and difficulties breathing and swallowing, which were addressed through early surgeries. He stated,

> Everybody is asking, and I guess it's more of a selfish type of question: "How's the mother? How's the kid doing?" The two main components of the situation, knowing that the father is still there dealing with all the same situations, maybe not involved as much, but, "How are you doing? Do you need anything," type of thing. "Are you coping with everything okay?"

Dylan, whose child had Fragile X syndrome, articulated a similar sentiment:

> There's a lot of things that go on from the standpoint from a father when you have a child with a disability. You know, traditionally, we're raised to be the breadwinners, the person that takes care of the household as far as, you know, financially, security wise. We're the father. We're the male figure. And our society dictates that. But we also have to start understanding that, you know, fathers are also affected by this, emotionally, and that emotional effect that occurs from having a child with a disability is something that needs to be recognized. It needs to be understood, not just from the vantage point of the school, but also for the father, that it's okay to feel some of the sadness, some of the emotional turbulence that you may be feeling as a result of having a child with disabilities.

Fathers also explored the unique emotional response that may be experienced when learning that their child's disability is genetic. While none of the fathers interviewed articulated this as their own experience, some hypothesized that other fathers may feel responsible for their child's disability and, at times, might disconnect from their fathering role and experience. Kenneth described, "It may be more difficult for men—fathers, in general—to channel, improve, address, remediate their shame, and a response to that may be a lack of inclination or a hiding away." Kenneth went on to link a father's possible feelings of shame to school involvement, saying, "There may be lack of engagement if their embarrassment is their lead factor."

How Do You Balance That? Fathers' Work Experiences and School Involvement

Fathers in this study described how work experiences were inextricably linked to their constructions of what it meant to be a father, particularly in their specific context of fathering children with complex disabilities. Connections between work and father involvement in child care and educational settings were identified by both fathers who were currently working, as well as those who were retired or stay-at-home dads. Fathers' work was implicated in both their indirect and direct school involvement, and the tensions in negotiating responsibilities between work and home life were often powerful for these fathers.

My income feeds the family: Fathers' work as indirect educational involvement. Fathers identified that their families experienced more extensive and long-term financial demands related to their children's complex learning and developmental needs. Aaron stated,

> For a lot of typical kids, they go to college. They grow up. They move out. They get their own thing, you know, their own job. They're out of the house. My kids are never going to be emancipated that they can move on without us.

Fathers' work was one way through which families could meet these unique financial needs. Aaron continued, "We will never retire. They will carry us out of here dead because I can never put enough savings away for my kid who can't care for himself or herself." Other fathers explained that their job allowed them to financially support the myriad of therapies and related services their children required. Kenneth stated that he was the "secondary parent" when it came to "time devoted to the children," but the "primary parent" in providing financially for the family. He elaborated, "It is my income which feeds the family and provides the benefits by which [my son] derives his therapy." Work allowed fathers to provide for not only the immediate needs of their children, but also for the long-term educational and personal needs of their children with complex disabilities.

I wish I was at school today: Father's work and direct educational involvement. Fathers described several aspects of their work experiences that made direct school involvement challenging. The most widely discussed aspect was the incompatibility of their work schedule and school events, meetings, and therapeutic services. This was especially true for fathers who worked nonstandard hours. Ivan decided to become a stay-at-home father a year after his daughter was born when he and his wife realized that "both of us working full-time wasn't going to work." Ivan described how his prior work schedule intersected with his parenting experiences during the first year of his daughter's life:

> I worked swing shift, and then I would watch [my daughter] at night. Basically when I got home, from midnight till 6:00 AM; and then the nurse would watch her during the day; [My wife] would watch her kind of during swing shift, and then so on. So there was kind of a period there where although I watched [my daughter] for a few more hours than my wife, it was when she was sleeping, and that wasn't when we would have people [therapists] coming to the house. So often I was sleeping when we had [therapists] come.

Ernie also described the unique challenges of working nonstandard hours:

> It's extremely hard when you work full time and different hours. For example, I work two o'clock in the afternoon till ten o'clock at night now, so I'm able to help my daughter in the morning with her schooling and getting off to school, but as far as being there for any kind of meetings or parent conferences, and after school activities, as of now, it's very challenging for me. I have to take off work, and you can't always do that. So, that's a little frustrating when you want to be involved and physically can't be there.

This difficulty in taking off time from work was shared by other fathers who described constraints regarding which school events and activities they could attend. Owen said, "I wish I was at school today, but her birthday was on Friday, so I took Friday off. So, I didn't want to take Friday and Monday." These fathers appreciated home–school communication books and teacher emails that kept them informed when

their work schedule made it difficult for them to come into the school. Technology also played an important role in mitigating the constraints that work sometimes placed on fathers' school involvement. Kenneth described the importance of technology in facilitating his involvement in IEP meetings:

> I've attended every IEP [meeting]. I've attended every teacher meeting. I've attended every parent-teacher conference. However, owing to my work schedule, some of those have been attended by me telephonically when I'm unable to get to the office. So I would say I go 70/30 on how many I can attend in person and how many I will dial into.

In addition to conflicts with school schedules, limited available time due to work made it challenging for fathers to engage in educational pursuits that would support their children's learning and communication. For example, Owen discussed the difficulty he had in learning American Sign Language (ASL) to communicate with his daughter with deafblindness. He stated, "With my time constraints, I try to take in as much as I can and my wife tries to teach me as much as she can. It's just tough."

While fathers often identified characteristics of their work experiences that inhibited their involvement in their children's education, fathers sometimes described how the location of their work site supported their school involvement with short commutes or being close to their child's school. For example, Brandon described how working in an office very close to his sons' school provided him with the opportunity to visit the school frequently. He said,

> With [sons'] school, I eat lunch there. My office is right there, in the same complex, so when I, if I'm in the area to have lunch, because I'm usually out on the road, I'll stop in and the teachers will come up "Oh, [son] is doing wonderful." The teachers know me real well. They know who I am.

There were also instances in which fathers identified ways in which the skills and expertise they gained through their jobs supported their advocacy for their children's educational needs. For example, Calvin's knowledge as a lawyer helped in understanding his daughter's IEP and educational rights. Jeremy spoke of how his managerial skills helped him to negotiate the "bureaucracy" of schools and in managing the conflict he experienced with educational professionals during an IEP meeting.

You just don't have enough time or energy: Juggling multiple responsibilities. Regardless of whether their work experiences inhibited or supported their school involvement, fathers articulated emotional stress in managing the multiple responsibilities they felt at work and as a parent. They experienced challenging emotional demands, along with more practical demands on their time. As Ivan stated about parenting a child with complex disabilities, "It doesn't ever feel like there's enough time in the day because there's so much to learn." He elaborated, "You just don't have enough time and energy, especially with CHARGE. It's not just the deafblindness. There's all the physical and eating issues, and the list goes on."

Calvin described the challenge of balancing employment with these multiple parenting responsibilities as he negotiated his school involvement:

> My daughter needs a lot of different things. She needs a lot of different services and things like that. But at the same time, in order to give her those things, I have to work. But I always feel like, I'd rather be home, working with her, than doing something, you know, at work. But it's not always feasible because I need to go to work.

He continued,

> If you're working, how do you balance that with, you know, working with your job, but also working with your child? That's probably, at least for me, that's been the toughest thing. Just because it's tough sometimes to balance different responsibilities.

These sentiments were shared by Ernie, who stated,

> It's hard. Being there is my biggest thing, and it's always what I want to do as a father is be there. And emotionally you always are very concerned and want to know what's going on at all times. And sometimes you can't be.

The emotional toll of balancing responsibilities was further complicated for some fathers who had difficulties in communicating with their children. Aaron, who has two children with multiple complex disabilities, said, "I feel so guilty that I can't spend the time that I should be spending with these kids, especially when it's real important to see how they're going to communicate, help them communicate with me." Calvin shared these concerns, stating,

> Sometimes it can be tough. You can sometimes feel like, "I'm not doing enough for my kid. I'm doing too much work and I'm not giving her all the attention that she needs for all these different academic goals and these different therapeutic goals." And it's not that you're really doing that, but you can feel that way.

Tag Team: Co-parenting Relationships and Fathers' School Involvement

Fathers' descriptions of their involvement in their children's educational settings included a consideration of their co-parenting relationships and the roles played by their children's mothers. Two thirds of the interviewed fathers identified their child's mother as being the primary parent involved in their child's education, whereas five fathers identified a more even split. Fathers hypothesized that several factors contributed to a greater school involvement of mothers, including a perceived unique expertise of mothers, as well as school environments that were more welcoming to mothers. Fathers also discussed some potentially negative ramifications of fathers being less involved in school settings, as compared with mothers.

The bulk of it: Mothers as the main source of information. The majority of fathers credited their wives in supporting them through navigating this unique context of fathering children with complex disabilities and in taking the lead in their children's school involvement. Jeremy stated, "I give my wife a lot of credit for part of that too where I was having trouble after [my daughter] was born or pulling back a little bit." Most of the fathers identified their wives as their main source of information about what was going on in their children's education. In these families, it was the mother's role to keep the father up-to-date on school occurrences. Fathers acknowledged the important work that their wives did in this area, which included communicating with teachers and therapists, making sure the child had access to educational materials, checking up with the school to be sure that they were implementing the IEP, being the "standard bearer" for schools, finding family advocates, and, in one instance, starting a local parent advocacy group. Fathers also recognized the work that mothers did in planning Parent Teacher Association (PTA) events and, in two families, serving on the local school board. In families of children with deafblindness, mothers sometimes served as the primary person to investigate communication methods.

For Marco's family, the approach of primary and secondary roles for parents in school settings made the most sense. As Marco articulated, "Well, I think it's engrained that Mom is number one and the question is does that really need to change?" Leo echoed this statement, saying,

> That's kind of how I feel with the parent one and parent two, and maybe that's not the right thing to do so much, but just how the way life—it's kind of the way you get through it sometimes. Fastest. It's just trying to keep our head down and keep the train moving.

In Ivan's family, limited time dictated the need for roles to be split between parents:

> There's only so much time in a day. We're okay with, there's sometimes where you just have a day you split responsibilities a little bit just because there isn't enough time in the day. But then you try to come back and connect on what needs to happen for this stuff.

Some fathers also identified their wives' unique characteristics as reasons that made them better suited to interact with the school. For example, Dylan spoke about how his wife was a teacher and with the

advantage of "professional understanding," while Nathan said that his wife had more "medical training," which helped her to have a better grasp on their child's needs. Marco identified the "bond between mother and child" as the primary reason he was not as involved in his son's education.

Fathers talked about the experiences of parenting a child with a complex disability as uniquely challenging for fathers and falling outside of their perceived areas of expertise. Kenneth stated, "A disproportionate amount of men want their sons to excel at sports, but there's not going to be a lot of autistic kids who are going to excel at sports." Owen, whose child has deafblindness, described feeling intimidated as he worked to learn a new mode of communication. He said,

> [I'm] not as good [in signing] as I'd like to be. My wife is good. Not great, but she can communicate with other deaf people. We had a birthday party Saturday. We had a few deaf people over from [the school], and there was a lot of signing going on, and I was very intimidated, and it's a lot to take in.

Leo expressed similar sentiments in supporting his child to do homework in braille:

> I have enough trouble with the English language to learn braille. It's difficult. So I can braille all the words with them [his kids], and let them braille their words and all that, but then she [mother] comes home and makes sure that we did it right.

While parenting challenges may affect mothers as well as fathers, fathers seemed to defer to their wives, whom they perceived as better equipped to successfully guide their child through their complex educational and learning contexts. As Dylan stated,

> The majority of fathers want to be involved but a lot of times, the fathers will feel that they may be treading on a topic or a subject matter that they're not really familiar with. Sometimes men, we do not feel comfortable with things that we don't understand, ok? Or, we feel that we're out of our level of expertise. So, a lot of times, we'll defer, traditionally, to the wife or the mother, for those things.

I make sure I'm here so she can fight: Fathers' support roles. Even within families in which mothers may be doing "the bulk of it" in terms of day-to-day school communication and advocacy, fathers articulated the important support role they played in this process. Leo said, "My role is to make sure that she's available to do those things and I take care of the other stuff." Leo also described how he would follow her lead on parenting activities or actions related to their child's education: "If she says to go and do it then I have [our daughter] go and do it, and if she says, 'We need to work on this thing,' that's what I work on." Ernie expressed a similar sentiment: "I make sure I'm here so she can fight and do everything she has to do for our daughter."

Although Brandon expressed support for his wife's primary role in school involvement, he still wanted to stay informed and aware of what was happening at school. He stated,

> I'll say, "Honey, you know what you're doing." You know? "Go ahead," you know? But she always asks my opinion even if I can't be there at the IEP meetings, she's always telling me what happened, what's going on, because I want to know. I mean, I'll read the IEP word for word. I mean, you know the IEPs can be pretty thick. And I read it word for word to make sure that everything is in there.

Fathers' co-parenting support also included doing parenting activities that were not preferred by the mother, and giving her a break in the process. Fathers described the process of acting like a "tag team" to support each other through frustrating parenting moments. Brandon states, "If she's frustrated, you know, she'll do 'Tag you're out. I'm out. I'm done'. And I'll go in."

Mommies are best: Professionals' attitudes. The deferral to the mother can be reinforced in school settings, which fathers identified as, at times, "prejudicial." Fathers conveyed the feeling that mothers were privileged in school settings by teachers and other school personnel. Ivan stated, "The therapists do tend to look at mom, and talk to her, and don't necessarily interact with the other parent, the father." Brandon

sometimes perceived teacher attitudes that "Mommies are the best." Jeremy stated, "The number one thing is that [fathers] feel like they're a non-factor. They're a secondary factor and they're not taken seriously by their wife, professionals, the others." This caused some frustration for some fathers who felt left out of the process. Aaron, who was divorced, said, "I've had to go back and say 'I'm a part of this too. I get the right to know about my kids'. I shouldn't have to remind them of that. I shouldn't have to fight for that."

Kenneth pointed out that "some distinct gender differences [exist] in how men will typically interact with the world and how women will typically interact with the world" that may be difficult for fathers to adjust to within schools. He elaborated that it can be challenging for fathers interacting with educational professionals who are "overwhelmingly female" and may have a different approach to communication and interpersonal interactions. It is important to note that not all interviewed fathers felt marginalized in their family–school partnerships; some felt that they were equal partners in their communication with educators. Calvin articulated this experience, stating,

> When I go into a meeting, IEP meetings or just parent-teacher conferences, they've always been pretty good about letting me know what's happening and I don't feel like my wife's being the one that's told everything and I'm just there along for the ride. I feel like they, you know, they talk to us both and I'm happy with that.

It's kind of a cyclical thing: Ramifications for fathers. Fathers suggested that those who play more of a secondary role to their wives in school involvement and collaboration with educational professionals may not be receiving all of the information regarding their child's educational and developmental progress and that, consequently, may affect their ability to participate as fully as they wish. As Aaron stated,

> We get to some of these parts of the meetings and I feel like, "I don't know what the hell anybody is talking about any more," and they just plow ahead. And you feel stupid to say, "You know, let's slow the meeting down so I understand."

Ivan shared these sentiments within the context of related services for his young child. Because he had not been present during his daughter's physical therapy sessions, he was not aware of the recommendations for how to support her development. Ivan articulated the co-parenting tension caused by this situation:

> I remember when me and my wife kind of had an argument because I felt like I didn't know what was going on. At first I think she was criticizing me because I wasn't following through with what the PT [physical therapist] wanted us to do. And I got critical because I was like "I don't even know what I'm supposed to do." It's like "You need to teach me what I need to do because I'm not there." I think that's kind of an eye opening moment for us to just realize that that's what was happening was I wasn't there, so I didn't know what I was supposed to do.

Fathers suggested that over time, this lack of understanding can have a snowball effect, in which some fathers may grow more and more distanced from the educational experiences of their children. Ivan articulated, "If you don't know what's going on, then you tend to have a hard time asking questions. Where it's kind of a cyclical thing, like you get further and further away from involved." This situation may be especially challenging for fathers of children who are deaf or deafblind. For some of these fathers, being "out of the loop" in working with educational professionals can make it difficult for them to communicate with their own child, and these difficulties may be magnified over time. Ivan articulated this experience:

> When we were taking the sign language classes, there was like three or four dads in there, and the wife's already taken that—it was kind of like the second level class or whatever . . . So their wives had already taken it on their own, and now they're there trying to catch up. But then they would still miss half a session because of work, and a lot of their stuff. As their kid gets older, you get further and further away from that communication part.

Fathers' Work Experiences and Co-Parenting Relationships

It is important to note that the contexts of work and the co-parenting relationship overlap and intersect in important ways in the lives of fathers. In particular, the work configurations in the household seemed to be associated with parenting roles for several of these fathers. For example, some fathers, who worked more hours than their wives, felt that their wives simply had more time available to be in contact with their children's schools. As Kenneth said, "Typically my wife, the mother, does that [pick up, drop off, homework]. She's a work-from-home mother, so she has much more flexibility in her part-time job to interact." Owen concurred,

> I go to work, two jobs, whereas I'm kind of on the outside of the doctors' appointments, the homecare, the normal day-to-day stuff that my wife sees, and she stays home all day and takes care of her. So you're on the outside a little bit.

Some fathers who worked full-time felt that because it was difficult for them to physically be present at the school, it was best for their wife to be the most involved in their child's education. However, this did not mean that the fathers cared less about their children's education and learning. Aaron pointed out,

> Most of the time, the father is the one at work, the mother staying home with the special needs kids. Just because we are not on the front lines of communication, we're not always there dropping off the kids and so forth, does not mean we do not care.

While there were fathers in dual-earner families who articulated that their wife still took a lead role in school involvement, other fathers identified unique constraints to their lives as dual-earner families that facilitated their involvement in their children's education. Calvin explained that in his dual-earner family, everyone, including extended family members, had roles that might include school drop-off, school pickup, transportation to therapy appointments, and getting ready for school in the morning. He said,

> My wife works too, so you know, she's just as busy as me at work, if not busier sometimes. So a lot of the different responsibilities at our house and responsibilities for our kids, we're sharing this stuff. I mean, she's probably, at the end of the day, doing more than me, but we try to share this stuff. So, I feel like ever since my daughter was born, I've been pretty involved with her, whether it was through early intervention or the school process. So, I never really felt like I was not having the same kind of role that my wife was in things, and it just might be a function of the fact that since we're both working, we're both kind of sharing some of these responsibilities.

Also in a dual-earner family, Hector said, "We don't really discriminate at home by gender. Mom and Dad, same thing, do the same stuff." He elaborated, "We try to share everything with him, and I'm the one going around, attending meetings, talking to professionals, and finding resources and things that he can do." Frank, whose wife worked full-time, described, "My wife and I would go in there [to IEP meetings] as a united front. Not just her all the time."

Discussion

The findings from this study reflect the collective experiences and perceptions of 15 fathers of children with complex disabilities, and illuminate the ways in which these fathers construct their school involvement within the nuanced systems of work and co-parenting. Data from this study indicate that fathers have complex emotions that call for support from professionals. Although there were no direct inquiries made regarding work experiences or co-parenting, nearly every father in this study identified his job and/or career and co-parenting relationship as factors that affect their participation in guiding their child's development and in their education.

Reflecting Bronfenbrenner's (1986) conceptualization of work as an exosystem influence on home–school mesosystem interactions, working fathers conceptualized their work as a sort of indirect involvement in their children's education, as their employment provided financial support for educational opportunities and therapeutic services. Exosystem-level characteristics of fathers' work were identified by fathers as either inhibiting or supporting their direct school involvement. Fathers pointed out emotional stress in managing the complex demands of work and parenting, and that they were looking for more insight and support from educators into their needs and their emotional well-being as parents.

These father interviews also addressed how family systems such as co-parenting (Minuchin, 1985) related to fathers' involvement in their children's development and education. Mothers and fathers often assumed different roles and responsibilities regarding school involvement activities. While some fathers reported feeling equally as involved as their wives, more often, fathers identified playing a secondary, supportive role to mothers. This secondary role did not mean that fathers were any less concerned about their children's education or that they cared any less than mothers. However, this secondary supportive role, combined with their perception of schools that may not have been as welcoming to fathers as they are to mothers, may have contributed to some fathers feeling disconnected from critical educational and developmental information. Fathers articulated frustration with this disconnect and a struggle to "catch up" with their co-parent. Fathers also expressed concern that once they are "left behind" in home–school partnerships, they have little chance to recover.

These fathers' interviews suggest that fathers often construct their school involvement with an overlapping consideration of their work and co-parenting contexts. Fathers who worked more hours than their wives often felt that this allowed mothers more time to be more directly involved in school activities than fathers. For some dual-earner families, in which mothers' and fathers' work commitments were more comparable, fathers expressed the need to share responsibilities more equally in terms of school involvement. It is important that educational professionals recognize the complexity of these co-parenting and work dynamics in shaping fathers' school involvement experiences, as families of children with complex disabilities often work out arrangements that are the most conducive and in the best interests of their families' dynamic needs.

This study builds upon a growing body of research examining fathers' school involvement (Kim & Hill, 2015; McBride et al., 2005), and helps to expand the focus of the extant literature to more fully consider fathers of children with complex disabilities. Congruent with the few previous studies of school involvement of fathers of children with disabilities (Carpenter & Towers, 2008; Mueller & Buckley, 2014), fathers in this study also identified feeling excluded from their children's educational experiences, although this was not an experience shared by all of the fathers in this study. This study extends previous work by highlighting the complex nuances of fathers' lives outside of schools and begins to identify some of the ways through which fathers' school involvement is situated within the exosystem context of father work (Bronfenbrenner, 1979) and the mother–father co-parenting family subsystem (Minuchin, 1985).

Implications for Practice

These findings highlight several implications for practice in schools and therapeutic settings. Professionals should consider fathers as equally important caregivers. Whatever the arrangements that each family might work out regarding their roles and responsibilities, teachers and other professionals should invite fathers to participate in the education of their child and consider them as primary caregivers. They may need targeted and sustained authentic outreach efforts to be sure that they stay "in the loop" in terms of their child's development and education. These efforts may be especially important with regard to children who are learning to communicate through alternative and augmentative modalities, including ASL, assistive technology, and braille. Fathers expressed preference for specific, ongoing, and flexible training opportunities around these communication modes and tools. For example, school personnel, especially those that lead the special education process, should create opportunities

for fathers to access information and assume that some parents require review and "catch-up." These opportunities may require developing alternative methods for parent participation such as meetings about a child that embed short trainings/review, use of online meetings with video capability, and scheduling meetings in evenings or other times outside of the school day.

It is important that teachers and other professionals understand that even when fathers are not as visible in schools, they often still want to stay informed. Frequent direct communication with fathers through communication books, emails, or other methods can help to supplement information that fathers may be receiving through their co-parents. Professionals should develop competency in using technology in their communication efforts with families, offering parents the opportunity to participate in team meetings through video conferencing, for example. There also needs to be a consideration by educators and therapists of the unique stress that fathers may experience as parents of children with complex disabilities. Professionals should consider how they can directly support fathers as they process their emotions regarding their child's disability and juggle multiple, sometimes conflicting, responsibilities. Periodically "checking in" with fathers through emails or phone calls could be a way to begin to develop a support system for these fathers. It may also be helpful to connect fathers with other fathers of children with complex disabilities, or to larger family support groups that target specific disability communities.

Limitations and Future Research

This study was limited by the small, relatively homogeneous sample of fathers interviewed. A further limitation was that co-parenting in the context of this study was situated within mother–father relationships. Future work in this area should address the diversity of father experiences from different family compositions. A broader consideration of co-parenting is needed that considers same-sex couples, single fathers, and co-parenting within the context of divorced and separated parents. A more complete understanding of fathers' school involvement must consider the experiences of fathers of children with complex disabilities from culturally and linguistically diverse groups, who may experience unique challenges and biases within the special education system. Gaining a better understanding of how culturally and linguistically diverse fathers of children with disabilities construct their school involvement would help to identify avenues for teacher training to better optimize the educational experiences of all students with disabilities and their families.

Findings from this study suggest that some fathers feel ignored and alienated in school settings, whereas others feel that they are seen as equal partners with mothers. Future research needs to more deeply explore the diversity in fathers' experiences and identify factors that contribute to fathers' full involvement in the educational experiences of their children. Research on fathers' experiences in schools should address what it means for a school climate to be "father-friendly." In addition, future work in this area should specifically address fathers who have felt alienated in their child's education and identify practices or experiences that would be effective in reengaging them in their children's development and education.

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Addressing Feeding Disorders Using High-Probability Sequencing for Children and Adolescents with Developmental Disabilities

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Abstract

Feeding disorders exhibited by children with developmental disabilities, which include limiting food intake or refusing to consume solid foods, often result in poor health consequences. Interventions for feeding disorders vary in terms of their acceptability to children with disabilities and their families. One specific procedure, the high-probability sequence, is a nonrestrictive approach where requests with which a child has a history of compliance are presented prior to requests associated with noncompliance. This article reviewed research concerning the application of high-probability sequencing for feeding disorders among children and adolescents with developmental disabilities. Experimental studies published between 1970 and 2018 in English as either peer-reviewed articles or dissertations were eligible for descriptive review. Identified articles ($N = 15$) evaluated high-probability sequencing using various single-case experimental designs. Participants ($N = 21$) were generally preschool-aged children (mean age = 5.7 years) diagnosed with autism spectrum disorder (ASD; $n = 9$) or other developmental disabilities ($n = 12$). Subsequent analysis of articles that met quality indicators of the What Works Clearinghouse ($n = 12$) suggests that research does not support the effectiveness of the procedure for increasing food acceptance. Implications for practice and future studies involving high-probability sequencing follow a discussion of findings.

Keywords

feeding disorders, systematic review, high-probability sequencing, developmental disabilities, single-case design

Feeding disorders are prevalent among children with developmental disabilities (Volkert, Patel, & Peterson, 2016). Specific disorders include the selective consumption of food items with certain characteristics (i.e., selectivity) and food refusal, or the rejection of all solid foods (Williams, Field, & Seiverling, 2010). Nearly one third of individuals diagnosed with developmental disabilities exhibit feeding problems, and estimations of prevalence among subpopulations, such as children with autism spectrum disorders (ASD), frequently exceed 80% (Seiverling, Williams, Ward-Horner, & Sturmey, 2011). Feeding disorders may stem from environmental (e.g., feeding routines), biological (e.g., gastroesophageal reflux [GERD] and oral motor restrictions), or behavioral factors (e.g., avoidance of specific foods; Volkert et al., 2016).

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For children with severe developmental disabilities, many of whom have comorbid physical conditions, feeding disorders may develop due to an inability to process food or physical discomfort associated with eating (Williams et al., 2010). Feeding disorders in ASD, though they may also be associated with physical conditions, typically stem from stereotypy or contextual variables (e.g., parent–child interactions; Seiverling et al., 2011) and are primarily behavioral. The etiology of feeding disorders has clear implications for the approach caregivers should use in specific instances. Underlying medical conditions do not preclude the use of behavioral interventions, however, as physical conditions are likely to promote behaviors designed to avoid food even after a successful medical treatment (Sharp, Volkert, Scahill, McCracken, & McElhanon, 2017). Feeding disorders related to physical conditions potentially require medical assistance, where practitioners may address selectivity or refusal related to contextual factors by altering the feeding environment. Regardless of the cause, children who exhibit feeding disorders are at risk of experiencing delays in physical development and cognitive maturation (Volkert et al., 2016).

Despite the urgent need for effective supports, the viability of specific care options for children with feeding disorders remains uncertain. Much of the recent literature on feeding disorders concerns children with ASD; nonetheless, reviews of studies involving children with ASD (Silbaugh et al., 2016) and developmental disabilities more generally (e.g., Volkert et al., 2016) have revealed limitations in the published research, including the lack of information regarding participant health characteristics. Instruments designed to assess the extent of feeding problems are increasingly available (e.g., *Brief Autism Mealtime Behavior Inventory* [BAMBI]; Lukens & Linscheid, 2008); however, authors often provide imprecise narrative descriptions of participants' feeding habits. Studies generally lack information regarding the ability of typical care providers to implement procedures with integrity (i.e., fidelity; Ledford, Whiteside, & Severini, 2018). For both children with ASD (Seiverling et al., 2011) and other developmental disabilities (Sharp, Jaquess, Morton, & Herzinger, 2010), the frequent use of researcher-implemented support packages composed of multiple procedures also inhibits conclusions regarding (a) the efficacy of specific procedures and (b) the feasibility of their use by typical caregivers. In addition, studies often do not include long-term outcomes for participants (Sharp et al., 2017).

Notwithstanding these concerns, research supports the effectiveness of behavioral techniques encompassing both restrictive (e.g., limit child movement) and nonrestrictive procedures for children with ASD (Ledford et al., 2018) and developmental disabilities (Sharp et al., 2010). Escape extinction, a restrictive method that prevents avoidance until food is consumed, is the most effective means of addressing feeding disorders (Volkert et al., 2016). Specific forms of escape extinction include nonremoval of the spoon, wherein a spoon is placed near the child's mouth until food is accepted, and physically guiding the child's mouth open (Borrero, Joseph Schlereth, Rubio, & Taylor, 2013). Issues with this approach include increases in the severity of inappropriate behavior as well as the punitive nature of the procedure itself (Volkert et al., 2016). Physical guidance is considered particularly aversive as it requires placing unspecified levels of pressure on a child's jaw (Kadey, Roane, Diaz, & Merrow, 2013). Consequently, stakeholders (e.g., parents) have found escape extinction to be less acceptable than other approaches (Vazquez, Fryling, & Hernández, 2019).

Nonrestrictive procedures encompass a range of techniques that either involve (a) the provision of nonaversive consequences following food acceptance or (b) adjusting the feeding context. Many procedures feature some form of positive reinforcement for food acceptance, wherein the child receives access to preferred activities, items, or stimulation following food consumption (e.g., Volkert et al., 2016). Caregivers can adjust the feeding context in a variety of ways. Noncontingent reinforcement, wherein the child is provided with access to preferred objects or activities throughout the meal, is associated with decreases in problem behaviors that inhibit food acceptance (e.g., González, Rubio, & Taylor, 2014). Nonrestrictive procedures also include adaptations to foods or the presentation of foods, such as coating a nonpreferred food item in a preferred condiment (e.g., simultaneous presentation; Volkert et al., 2016).

Although parents prefer nonrestrictive procedures, evidence regarding their effectiveness in the absence of escape extinction is mixed (Vazquez et al., 2019). Marshall, Ware, Ziviani, Hill, and Dodrill (2015) found that of the 23 studies involving children with ASD, all included some form of escape extinction. Research evaluating escape extinction alone and in combination with alternatives (e.g., noncontingent reinforcement) further suggests that escape extinction exclusively accounted for increases in food consumption (e.g., Reed

et al., 2004). In addition, many nonrestrictive procedures incur practical costs associated with the preparation (e.g., simultaneous presentation) and the time required to remove supports that may ultimately interfere with independent food consumption (Volkert et al., 2016).

High-probability sequencing represents an additional nonrestrictive procedure with potential benefits for practitioners and the children they serve. The procedure consists of presenting requests with which an individual has a high probability of compliance (i.e., high-probability requests) immediately prior to a request associated with noncompliance (i.e., low-probability requests; Volkert et al., 2016). The effectiveness of the procedure results from increasing the rate of reinforcement provided for compliance to low-probability requests, resulting in the greater likelihood of compliance for other requests delivered in the same context (Lipschultz & Wilder, 2017). Consequently, factors such as the use of high-quality reinforcement, an empirical method for identifying the high-probability sequence (e.g., preference assessments), and the number of requests used contribute to the success of the procedure. High-probability sequencing is effective for a wide range of behaviors (e.g., academics, social skills), with much of the literature supporting the efficacy of the procedure involving individuals with severe disabilities.

For feeding disorders, high-probability sequencing may hold benefits beyond similar nonrestrictive procedures because it (a) requires few resources to implement, (b) may be demonstrated to stakeholders (e.g., parents) as a means of encouraging a range of behaviors, and (c) results in the child accepting novel foods without the need for the elimination of additional supports (e.g., fading). Recent overviews of effective practices for children with ASD suggest that high-probability sequencing may increase food acceptance (e.g., Ledford et al., 2018). Nonetheless, research regarding this procedure for children with developmental disabilities has not been examined systematically. Relative to children with ASD, feeding disorders in children with developmental disabilities are often linked to physical constraints (Volkert et al., 2016). Given that the needs of children with ASD and children with more severe disabilities may vary, a comprehensive review of the high-probability sequencing literature is warranted.

Feeding disorders represent a threat to the short- and long-term health of children with developmental disabilities (Sharp et al., 2017). High-probability sequencing is a potentially effective nonrestrictive approach to food selectivity that may offer practical benefits relative to similar procedures. The current review evaluated the characteristics of participants and support packages featured in studies involving high-probability sequencing and feeding disorders. Research questions included the following:

Research Question 1: What are the characteristics of participants, methodology, and interventions?
Research Question 2: To what extent are studies of high-probability sequencing consistent with current quality standards (i.e., What Works Clearinghouse [WWC], 2017)?
Research Question 3: What are the outcomes associated with using high-probability sequencing to address feeding disorders?

Method

A systematic search of the literature was conducted to identify studies that featured high-probability sequencing as an approach to increasing food acceptance. We then completed a descriptive review of identified articles and assessed study quality using the WWC (2017) quality standards. Finally, we analyzed the outcomes of studies that met minimum quality standards.

Search Strategy

A three-step process identified studies for inclusion. First, electronic searches of the Proquest Education, ERIC (Education Resources Information Center), Proquest Dissertations & Theses Global, Proquest Social Science Premium Collection, PsycINFO, and PsycARTICLES databases were completed to find studies in peer-reviewed journals and dissertations. To identify studies reflective of modern practice, we included articles published between 1970 and April 2018. An abstract search featured terms specific to high-probability sequencing (i.e., "high probability" or "behaviour momentum" or interspersal or "generalized

compliance training") and all possible truncations of the target behavior (i.e., *feed*, food*, or eat**). The electronic search yielded 370 results, nine of which met inclusion criteria.

We also performed an ancestral search that included reviewing citations featured in previously identified articles and relevant literature reviews (i.e., Ledford et al., 2018; Silbaugh et al., 2016; Volkert et al., 2016). This search revealed two additional articles. Google Scholar was used to perform a forward search of literature that had cited studies identified in the previous searches. A subsequent examination of 590 abstracts resulted in the identification of four articles. A hand search of the *Journal of Applied Behavior Analysis* (JABA), *Behavioral Interventions* (BI), and *Journal of Autism and Developmental Disabilities* (JADD) was completed for volumes starting in 2013 through August 2018. The hand search produced no additional studies.

Inclusion Criteria

Studies were evaluated following the search to determine whether they met the following criteria: (a) appeared in a refereed article or doctoral dissertation, (b) implemented a group- or single-case design, (c) included participants under the age of 18 with an identified developmental disability or delay who exhibited food selectivity or food refusal, and (d) used high-probability sequencing, in which a nonpreferred food is introduced following the presentation of highly preferred foods or tasks, to target food acceptance. Single-case studies with at least one participant who was described as having a developmental disability or delay were eligible for inclusion, regardless of the disability status of other participants. However, we excluded group designs in which results pertaining to individuals with disabilities were not disaggregated from the total sample. Master's theses and studies in which authors did not explicitly identify participants as having a developmental disability or delay were excluded. Also excluded were studies or cases involving the use of high-probability sequencing for responses other than food acceptance (e.g., chewing prior to swallowing; Silbaugh & Swinnea, 2018). All retrieved abstracts were reviewed by the first author and a trained doctoral student, who independently determined whether articles were either eligible or ineligible for inclusion. For instances in which one of the two reviewers was not certain of inclusion based on the abstract alone, the full article was retrieved and reviewed independently by each reviewer.

Coding Procedures

Each included article was independently reviewed by the first author and three trained doctoral students. Across each category, authors entered values corresponding with codes into separate spreadsheets, which were then compared to determine interrater agreement (IRR).

Participants, methodology, and interventions. Codes for participants, methodology, and interventions were developed prior to the identification of studies based on questions of interest as well as previous reviews of intervention literature (e.g., Silbaugh et al., 2016) and high-probability sequencing (e.g., Lipschultz & Wilder, 2017). Codes either described specific information reported by the authors (e.g., setting, design) or indicated the presence or absence of information or procedure related to a category (e.g., fidelity). Article codes appear in Table 1.

Quality assessment. High-quality studies eliminate alternative interpretations for research findings and allow definitive conclusions regarding the efficacy of a procedure. We evaluated research quality using the quality standards of the WWC (2017). As the search did not identify group design studies, only the single-case standards, which primarily assess elements relevant to internal validity, were used (e.g., King, Lemons, & Davidson, 2016). The WWC guidelines identify the case as the unit of analysis for determining the relationship between an independent variable and changes in outcomes. Design-specific criteria appear in Table 2.

We defined a case as a design (e.g., changing criterion, Gast & Ledford, 2014) within a study (i.e., article) that attempted to demonstrate at least two replications (e.g., A-B-A design) of the effect of

Table 1. Description of Coding Categories.

Category/codes	Description
Participants	
Demographics	Gender and age of participants
Diagnosis	Includes *ASD* (Asperger's, autism, PDD-NOS) and *developmental disabilities* stemming from congenital or genetic factors
Cognitive ability	Authors reported intellectual disability among participants[a]
Problem behavior	Authors reported children exhibited inappropriate behavior[a]
Feeding disorder	*Selectivity* refers to limited eating; *refusal* refers to absence of eating
Physical constraints	Presence of physical condition that could impede consumption[a]
Methodology	
Setting	Includes *home, school,* or *clinic*
Design	Describes group or single-case experimental designs (e.g., *reversal*)
Social validity	Reported treatment acceptability or social significance of results[a]
Fidelity	Reported assessing the implementation of the treatment protocol[a]
Generalization	Attempted to demonstrate generalization across settings or foods[a]
Maintenance	Collected data following the conclusion of treatment[a]
Intervention	
High-probability sequence	Antecedent requests categorized as *task-related activity* (e.g., motor skill), *food-related* activity (e.g., smell food), or *food consumption* (e.g., eat food). Factors linked to the success of the procedure (i.e., number of high-probability requests, preference assessments) were also recorded
Extinction	Preventing a child from escaping food consumption[a]
Reinforcement	Presentation of preferred stimuli, such as tangibles, after consumption. *Praise* was coded separately when authors indicated it was provided or acceptance was otherwise followed by statements of approval[a]
Food modification	Changes to texture or appearance of food prior to presentation[a]
Prompts	Includes *prompts* that refer to assistance provided following an incorrect response and *models* that demonstrate a behavior prior to an initial request
General antecedent	Other alterations of the demand sequence (e.g., fading)[a]
Duration	Number of sessions and trials per session, as well as time per session.

Note. ASD = autism spectrum disorders; PDD-NOS = pervasive developmental disorder not otherwise specified.
[a]Options for code were binary (i.e., yes or no) indications of whether authors reported (a) participants exhibited a specific characteristic or (b) completing a specific procedure.

high-probability sequencing relative to a single comparison data path (e.g., baseline). Phases not intended to demonstrate experimental control (e.g., maintenance) were not evaluated. AB designs were not considered cases except in studies where they represented the only design. One participant could constitute several cases (e.g., reversal design), and multiple participants could constitute only one case (e.g., multiple baseline design). Combined designs were assessed as separate cases. A combined multiple baseline design across three participants and alternating treatments design with two conditions could encompass five cases. Alternating treatments designs for each of the three participants would represent a case ($n = 3$), and the two conditions from the alternating treatments design, in the context of the multiple baseline design, would result in an additional two cases. The design, page number, and location of cases were entered into a spreadsheet. We then determined the presence or absence of the quality standards for each case.

Outcomes. Following the quality assessment process, we eliminated cases that did not meet quality standards due to the potential for these studies to distort the analysis of outcomes (WWC, 2017). Effectiveness of the interventions featured in cases that met minimum standards (i.e., with reservations or greater) of the WWC was determined using visual analysis and the percentage of nonoverlapping data (PND; Gast & Ledford, 2014). Effects of individual cases embedded within a combined design were calculated separately.

Table 2. What Works Clearinghouse (2017) Quality Indicator Ratings.

Quality indicators	% Cases met (*n* cases/studies)
Systematically manipulated independent variable	100 (53/15)
Interobserver agreement of 80% for ≥20% of sessions	92 (49/12)
Reversal design	36 (19/8)
Minimum of four conditions with ≥3 data points per condition	68 (13/5)
At least two adjacent blocks of condition pairs (e.g., A-B-A-B)	79 (15/7)
Met all standards	68 (13/6)
Alternating treatments design	38 (20/8)
Four points per condition, with <2 points per phase	70 (14/7)
Met all standards	70 (14/7)
Multiple baseline/multiple probe (MP)	25 (13/6)
Minimum six conditions with ≥3 data points per condition	31 (4/4)
Features concurrent conditions	77 (10/4)
Overlapping data for initial baseline sessions (MP only)	38 (5/3)
At least one data point within three sessions of intervention (MP only)	62 (8/5)
Baseline present if intervention begins or criterion met (MP only)	38 (5/4)
Met all standards	8 (1/1)
Changing criterion	2 (1/1)
At least three criterion changes with ≥3 data points per phase	100 (1/1)
Met all standards	100 (1/1)
Met all standards across designs	55 (29/12)

Note. Unindented rows present total percentage of cases meeting criterion relative to the actual number of cases and studies. Indented items refer to proportion of cases within a subcategory.

Findings were separated based on the research objectives facilitated by the design (e.g., comparison of different approaches).

Visual analysis. Visual analysis—regarded as the standard method of interpreting single-case design (Gast & Ledford, 2014)—was used as the primary means of determining the presence of a functional relation. A functional relation was defined as a change in acceptance of food across three or more applications of high-probability sequencing. The immediacy of change following implementation of the intervention, proportion of data overlap between phases, and general data patterns (e.g., variability, level, trend) were also considered. Following review, coders indicated the presence or absence of a functional relation depicted within a data comparison comprising a specific case.

PND. The proportion of intervention values exceeding all baseline data points, PND is a standard feature of visual analysis (Gast & Ledford, 2014). Limitations of PND include a sensitivity to outliers and an inability to account for data trends (Carter, 2013). However, PND was selected due to the lack of assumptions regarding its use, its applicability across a range of single-case designs, and the limited relevance of trend to many of the designs identified in the search (e.g., alternating treatments design). Previous reviews also suggest that PND is correlated with other nonoverlap effect sizes (e.g., improvement rate difference [IRD]; King et al., 2016). Given these factors and the limitations with nonoverlap effect sizes more generally (e.g., Carter, 2013), we selected PND as a supplement for our primary means of analysis (i.e., visual analysis).

For reversal and multiple baseline designs, we calculated PND by determining the range of baseline values and the number of intervention data points outside of this range using drafting tools. These data points were divided by the total number of intervention data points and multiplied by 100. PND for alternating treatments designs was derived through individual comparisons of data pairs across conditions. Maintenance and generalization conditions were not analyzed. For changing criterion designs, PND was

calculated by dividing the number of data points at or above criterion by the number of data points in a condition. PND values across conditions were averaged for each case. Cases comparing the same treatments within each study were then subsequently averaged. Negligible, moderate, and large effects reflected respective PND values of <50%, 50% to 70%, and >70%, respectively (King et al., 2016).

IRR

Article inclusion. Three researchers independently coded all abstracts to determine eligibility of articles identified in the search. The first author trained two doctoral-level assistants using sample materials until agreement exceeded 90% on three consecutive abstracts. The first author and the assistant researchers then reviewed all abstracts and rated them as either eligible or ineligible. We defined agreement for abstracts as reviewers reaching the same conclusion regarding article inclusion. Agreement for all identified abstracts was 100%.

Coding procedures. The research team trained in the application of codes related to participants, methodology, and interventions; quality assessment; and outcomes using sample materials until agreement exceeded 90% on three consecutive articles. Except for PND, we calculated IRR by dividing the number of disagreements by the total number of items and multiplying by 100. For article participants, methodology, interventions, and quality assessment, we defined agreement as reviewers recording an identical code for a single category. Case identification agreement was defined as both reviewers identifying the same cases within an article. Agreement for visual analysis was defined as both reviewers arriving at the same conclusion regarding the presence or absence of a functional relation for a case. IRR for PND was calculated by comparing the PND values derived by two reviewers who independently coded the same case and dividing the smaller value by the higher value. IRR for participant, methodology, and intervention codes across 100% of studies was 95% (range = 89%-100%; *SD* = 3). For case identification, IRR across 47% (n = 7) of studies was 96% (range = 76%-100%; *SD* = 9). Average IRR for quality assessment across 47% (n = 25) of cases was 95%. IRR for visual analysis and PND of 31% (n = 9) of eligible cases was 100% and 97% (range = 76%-100%; *SD* = 1), respectively. Disagreements were resolved via author consensus.

Results

The search resulted in the inclusion of 15 studies, including two dissertations and 13 peer-reviewed articles. Group designs were not identified in the search. All studies evaluated the effect of high-probability sequencing using single-case designs. Within the studies, we identified 53 cases, for an average of four cases per study (range = 1-18; *SD* = 5). All studies were included in the descriptive review of participant characteristics, methodological features, and intervention components. Individual cases within studies were assessed using the WWC quality indicators for single-case design. We analyzed cases that met quality standards using visual analysis and PND.

Participants

Studies included 21 participants, with one participant appearing across two separate studies (*Mary*; Dawson, 2001; Dawson et al., 2003). Authors reported the gender of 86% (n = 18) of participants; of these, 67% (n = 12) were male. Although specific ages for three young children (3-5 years) were not reported, the remaining participants ranged from 2.5 to 15 years (M = 5.7; *SD* = 3.9). Preschoolers (1-5 years) represented the majority of participants (67%; n = 14). The remaining participants were identified as elementary (6-9 years; 19%; n = 4), middle (10-13 years; 10%; n = 2), or high school–aged children (14-17 years; 5%; n = 1). Studies evaluated effectiveness of procedures in participants' homes (47%; n = 7), schools (20%; n = 3), and clinical settings (40%; n = 6). Two studies employed the procedure across multiple settings (home and school, Johnson & King, 2017; home and clinic, Penrod, Gardella, & Fernand, 2012). The setting was not reported in a single study. Researchers or staff typically administered procedures (93%; n = 14). In a small

number of studies (27%; $n = 4$), parents provided procedures independently (e.g., Gentry & Luiselli, 2008) or adopted the procedure after researchers initially delivered the intervention (Ewry & Fryling, 2016; Patel et al., 2006; Penrod et al., 2012).

Authors identified 43% ($n = 9$) of participants as having a diagnosis of ASD, although information regarding the severity or manifestation of the disorder appeared for few participants ($n = 2$). For the remaining participants (57%; $n = 12$), diagnoses included mild developmental disabilities and disabilities requiring intensive cognitive and physical supports (e.g., Dandy-Walker syndrome; Babbitt et al., 1994). Participants in a small portion of studies (Casey et al., 2008; Dawson, 2001; Patel et al., 2006) exhibited problem behaviors (24%; $n = 5$). Reports regarding cognitive functioning appeared for only 14% ($n = 3$) of participants; of these, one participant was identified as having an intellectual disability (Babbitt et al., 1994). Details regarding verbal ability was provided for 29% ($n = 6$) of participants. Authors suggested a portion of participants required support related to receptive or expressive communication ($n = 5$), although one participant demonstrated typical verbal ability (Johnson & King, 2017).

Researchers often determined the nature of feeding disorders using unspecified parental assessments (40%; $n = 6$). Clinical diagnoses (7%; $n = 1$) and researcher-administered tests (13%; $n = 2$) appeared less often. The manner in which researchers determined the participants' feeding disorder was not provided in 40% ($n = 6$) of studies. Food selectivity was the most common disorder (62%; $n = 13$). Descriptions of selectivity included "picky eating" (Congdon, 2013, p. 24), restricted consumption (e.g., proteins only, Penrod et al., 2012), and the avoidance of healthy foods (Ewry & Fryling, 2016) or items based on texture/color (Silbaugh & Swinnea, 2018). The remaining participants (38%; $n = 8$), which included individuals with ASD and developmental disabilities, exhibited food refusal and received nutrients through a liquid diet or enteral tube. Physical conditions with the potential to impede food consumption were identified in 29% ($n = 6$) of participants, all of whom were diagnosed with developmental disabilities (i.e., Dawson, 2001; Dawson et al., 2003; McComas et al., 2000; Patel et al., 2006).

Method

Featured designs ($N = 16$) included alternating treatments (13%; $n = 2$), A-B-A-B (31%; $n = 5$), changing criterion (6%; $n = 1$), and multiple probe/baseline across behaviors designs (19%; $n = 3$). Several designs combined alternating treatments designs with A-B-A-B or multiple baseline designs (31%; $n = 5$). Social validity was assessed in few studies (20%; $n = 3$). Fidelity was assessed in 40% ($n = 6$) of studies. Maintenance and generalization were assessed in 47% ($n = 7$) and 27% ($n = 4$) of studies, respectively.

Intervention

Researchers evaluated at least one of three types of high-probability sequencing procedures (i.e., food-related, task-related, food consumption; see Table 1). Several studies (53%; $n = 8$) featured task-related sequences (e.g., "show me Oscar," McComas et al., 2000, p. 164). An equal number of studies (53%; $n = 8$) also featured food-consumption sequences (e.g., Johnson & King, 2017). Two studies used multiple sequences (Patel et al., 2006) or compared the effectiveness of two separate sequences (Trejo & Fryling, 2018). High-probability sequences pertaining to food-related tasks appeared infrequently (20%; $n = 3$). Often, food-related tasks involved interacting with the food targeted for acceptance (Silbaugh & Swinnea, 2018).

Preparation and administration of high-probability sequencing differed slightly across studies. The ratio of high-probability to low-probability requests, reported in 73% ($n = 11$) of studies, was typically 3:1 (60%; $n = 9$). Presentation ratios of 2:1 ($n = 1$) and as high as 5:1 ($n = 1$) were less common. Authors reported using preference or compliance assessments to assess child preferences for targeted foods or sequence tasks in 67% of studies ($n = 10$).

High-probability sequencing was directly compared with a number of procedures. In studies with baseline phases (87%; $n = 13$), few authors reported an absence of interventions prior to the implementation of

high-probability sequencing (20%; $n = 3$). Baseline procedures primarily involved praise or other forms of reinforcement (67%; $n = 10$). Additional baseline procedures included prompting (20%; $n = 3$), escape extinction (13%; $n = 2$), and general antecedents (7%; $n = 1$). In addition, packages featuring high-probability sequencing were evaluated in comparison with non-baseline intervention conditions (47%; $n = 7$; see Table 3).

Researchers frequently implemented high-probability sequencing in combination with other approaches. Common components combined with high-probability sequencing included escape extinction (33%; $n = 5$), reinforcement (53%; $n = 8$), noncontingent reinforcement (33%; $n = 5$), and general antecedents (33%; $n = 5$). Prompting (29%; $n = 4$) and food modification (7%; $n = 1$) appeared less frequently.

The total time required for the implementation of procedures varied considerably across studies. On average, participants received 34 support sessions (range = 3-98 sessions; $SD = 24$). Eight studies (53%) reported the number of food presentation trials administered in each session ($M = 10$; range = 5-12; $SD = 2$). Few studies (27%; $n = 4$) provided the duration of sessions, however ($M = 14.2$ min; range = 5-17.5 min).

Quality Assessment

Of the 53 cases identified across studies, 55% ($n = 29$) satisfied quality standards (WWC, 2017). These cases appeared across 80% of studies ($n = 12$), with an average of two cases per study (range = 0-8; $SD = 2$). Cases that met standards were typically alternating treatments (48%; $n = 14$) or A-B-A-B designs (45%; $n = 13$). Qualifying multiple baseline/probe designs were relatively scarce (3%; $n = 1$) due to the lack of replications of effect or the use of nonconcurrent designs (e.g., Meier, Fryling, & Wallace, 2012). The results of the quality assessment process appear in Table 2.

Outcomes

Study outcomes appear in Table 3. Of the cases that met quality indicators, 59% ($n = 17$) demonstrated a functional relation between an intervention and an increase in food acceptance across nine studies, with an average of one case per study (range = 0-4; $SD = 1$). However, few studies ($n = 7$) contained cases (38%; $n = 11$) demonstrating the effectiveness of high-probability sequencing. Average PND was indicative of a negligible effect ($M = 42\%$; range = 0-100; $SD = 38$). Study objectives included the following: (a) demonstration of the effectiveness of the procedure, (b) evaluation of packages featuring high-probability sequencing, (c) comparison of high-probability sequencing with other procedures, or (d) comparing different forms of high-probability sequencing.

Effectiveness of high-probability sequencing. A total of nine cases across seven studies compared the effectiveness of high-probability sequencing with a baseline condition using alternating treatments ($n = 4$), A-B-A-B ($n = 4$), or multiple probe designs ($n = 1$). Studies featured nine participants. A functional relation was observed in 56% ($n = 5$) of cases across 29% ($n = 4$) of studies. Average PND across cases was consistent with a moderate effect ($M = 61\%$; range = 25-100; $SD = 39$). High-probability sequencing was effective in 56% ($n = 5$) of participants. Of the children identified with food selectivity ($n = 5$), 40% responded to high-probability sequencing. The procedure was effective for a larger proportion (75%) of children identified with food refusal. The single attempt at using a food-related sequence was ineffective ($n = 1$). Food-consumption (44%; $n = 4$) and task-related (44%; $n = 4$) sequences appeared in a larger portion of cases. Each of these was successful in 75% of their respective administrations (i.e., three of four).

Effectiveness of packages featuring high-probability sequencing. Researchers compared packages featuring high-probability sequencing with baseline phases within five cases in four studies featuring A-B-A-B ($n = 2$), alternating treatments ($n = 2$), and changing criterion ($n = 1$) designs. Studies included five participants. Functional relations were observed in 100% of cases, although concurrent designs (Dawson, 2001; Dawson et al., 2003) indicated that high-probability sequencing was not responsible for improvements. Average PND was indicative of a large effect ($M = 80\%$; range = 33-100; $SD = 32$). Authors identified the majority

Table 3. Summary of Studies Featuring High-Probability Sequencing for Food Selectivity.

Study	Design (C/EC)	*n*	Age (Range)	DG	FD	IV	Results (PND)
Babbitt et al. (1994)	DMBS (1/0)	1	5	DD	RF	HP-T, RFT, FM, GA (fading)	*Summary*: Insufficient for analysis
Casey et al. (2008)	R (1/0)	1	8	ASD	RF	*T1*[a]: HP-F, NCR, RFT (i.e., FCT & escape), EXT, GA (choice), PPT; *T2*: No FCT, GA (new foods), PPT; *T3*: Reduced RFT criterion; *T4*: No PPT; *T5*: Staff implementation	*Summary*: Insufficient for analysis
Congdon (2013)	ATD (5/3) + MBP (2/0)	3	NR (3-5)	ASD	S	*B*: PSE; *T1*: HP-T; *T2*: HP-FR; *T3*: HP-T, RFT, NCR; *T4*: HP-FR, RFT, NCR	*ATD*: T2 = T1(20); T3 < T4: (29) *Summary*: No effect of HP-T; HP-FR package more effective than HP-T package
Dawson (2001)	R (6/3) + ATD (6/5) + MBP (6/0)	3[b]	2.75 (2.5-3)	DD	RF (1) S (2)	*B*: PSE; *T1*: HP-T (1) HP-F (2), PPT; *T2*: EXT; *T3*: HP-T (1), HP-F (2), PPT, EXT	*A-B-A-B*: T1 < T2 (8); T1 < T3 (0); T3 > B (100) *ATD*: T1 = B (27); T3 = T2 (32) *Summary*: No effect of HP over B or on EXT; EXT more effective than HP
Dawson et al. (2003)	R (3/3) + ATD (2/2)	1	3	DD	RF	*B*: PSE; *T1*: HP-T, PPT; *T2*: Ext.; *T3*: HP-T, PPT, EXT	*A-B-A-B*: T1 < T2 (0); T1 < T3 (13); T3 > B(33) *ATD*: T1 = B (27); T2 = T3(13) *Summary*: No effect of HP
Ewry and Fryling (2016)	*R* (1/1)	1	15	ASD	S	*B*: PSE; *T*: HP-F	*A-B-A-B*: T > B (100) *Summary*: Large effect of HP
Gentry and Luiselli (2008)	CC (1/1)	1	4	DD	S	*T*: HP-F, RFT, NCR, GA (variable RFT criterion)	*CC*: T > BL (85) *Summary*: Large effect of intervention relative to BL
Johnson and King (2017)	MPB (1/1)	1	11	ASD	S	*T*: HP-F	*MPB*: T > BL (89); *Summary*: Effect of HP
McComas et al. (2000)	ATD (1/1)	1	1.8	DD	RF	*T1*: HP-T, EXT, RFT, GA (choice), NCR; *T2*: EXT, RFT, GA (choice and different foods), NCR	*ATD*: T1 = T2 (50) *Summary*: No differences in participant response

(continued)

Table 3. (continued)

Study	Design (C/EC)	*n*	Age (Range)	DG	FD	IV	Results (PND)
Meier, Fryling, and Wallace (2012)	NCMBB (1/0) + R (2/1)	1	3	ASD	S	*B*: PSE; *T*: HP-F	*NCMBB: R*: T = B (25) *Summary*: No effect of HP
Patel et al. (2006)	R (2/2); R (2/2) + ATD(1/0)	3	3.33 (2-6)	DD	RF	*R*(2)—*B*: EXT, PSE, PPT; *T1*: HP-T *R/ATD* (1)—*T2*: PSE, HP-F; *T3*: PSE, EXT; *T4*: PSE, EXT, HP-F	*A-B-A-B*: T1 > B (89); T2 < T3 (0); T2 < T4 (0) *Summary*: HP Effective (2); HP less effective than EXT or HP and EXT (1)
Patel et al. (2007)	*R* (1/1)	1	4	ASD	RF	*B*: PSE, PPT; *T*: HP- T	*A-B-A-B*: T > B (100) *Summary*: Large effect of HP
Penrod, Gardella, and Fernand (2012)	ATD (2/2)	2	9.5 (9-10)	ASD	S	*B*: PPT, PSE; *T*: RFT, PPT, GA (fading), NCR, HP-FR	*ATD*: T1 > B (100) *Summary*: Large treatment effect
Silbaugh and Swinnea (2018)	*R* (1/0)	1	4	ASD	S	*B*: RFT; *T*: HP-FR	*Summary*: Insufficient for analysis
Trejo and Fryling (2018)	NCMBB (2/0) + ATD (3/1)	1	9	ASD	S	*B*: PSE; *T1*: HP-T; *T2*: HP-F	*Summary: ATD*: T1 = T2 (25). No difference in participant response

Note. Age represents mean where applicable. Baseline did not feature intervention unless otherwise indicated. Elements appearing in baseline appeared in all other treatment conditions. Outcomes of designs not of sufficient quality to demonstrate a functional relation were not analyzed. Outcomes with PND and "=" indicative of no functional relation between conditions. PND value refers to leftward treatment condition. Dissertation studies are italicized. C = cases; EC = cases eligible for review following quality assessment; DMBS = delayed multiple baseline across settings; ATD = alternating treatments design; R = reversal or multiple component; NCMBB = nonconcurrent multiple baseline across behaviors; MBP = multiple baseline across participants; MPB = multiple probe across behaviors; PND = percentage of nonoverlapping data; CC = changing criterion; "+" = combined designs; DG = diagnosis; DD = developmental disabilities; ASD = autism spectrum disorder; FD = feeding disorder; RF = refusal; S = selectivity; IV = independent variable; EXT = escape extinction; GA = general antecedent; NCR = noncontingent reinforcement; FR = food-related; F = food; HP-T = high-probability sequencing involving tasks unrelated to food; HP-FR = high-probability sequencing related to aspects of eating that did not involve consumption; HP-F = high-probability sequencing involving the consumption of foods; RFT = reinforcement; PPT = prompt; PSE = praise; FM = food modification; B = baseline; T = treatment.

[a]Subsequent interventions contained all components unless otherwise noted.

[b]Includes participant from subsequent publication whose data contributed to an unpublished multiple baseline design.

of participants (80%; $n = 4$) as exhibiting food selectivity. Packages were effective regardless of diagnosis or use of consumption (40%; $n = 2$), task (20%; $n = 1$), or food-related sequences (40%; $n = 2$).

Comparing high-probability sequencing with other approaches. Researchers compared high-probability sequencing in isolation or combined with other procedures to alternative packages within eight cases across four studies. Cases encompassed five participants. Designs included alternating treatments (63%; $n = 5$) and A-B-A-B designs (38%; $n = 3$). Functional relations were demonstrated in 38% ($n = 3$) of cases; however, all revealed a negative effect of high-probability sequencing in comparison with escape extinction (Dawson, 2001; Dawson et al., 2003; Patel et al., 2006). PND across cases was indicative of negligible effect of high-probability sequencing ($M = 17$; range = 0-50; $SD = 20$). The majority of participants exhibited food refusal (60%; $n = 3$). Food-consumption (63%; $n = 5$) or task-related (38%; $n = 3$) sequences were used.

Comparing separate high-probability sequencing procedures. Authors compared different types of high-probability sequences or two sequences combined with different procedures in seven cases across five studies that featured alternating treatments ($n = 4$) and A-B-A-B designs ($n = 3$). Studies involved seven participants. Functional relations were demonstrated in 57% ($n = 4$) of cases. High-probability sequencing featuring food-consumption or task-related requests was frequently associated with failure to accept food entirely and was more effective when combined with escape extinction ($n = 3$; e.g., Dawson, 2001). Four cases compared the relative effectiveness of food-related and task-related high-probability sequencing. Most of the three cases featured in Congdon (2013) revealed no differences between the procedures, although task-related sequences were less effective in a single case. Trejo and Fryling (2018) likewise found no difference between the two sequences. Average PND of high-probability sequencing alone was 4% (range = 0-13; $SD = 8$). Seventy-one percent of participants ($n = 5$) were diagnosed with food selectivity, with the remaining participants refusing food entirely. Functional relations were observed in all cases involving food refusal and two cases involving food selectivity.

Discussion

This review evaluated studies featuring high-probability sequencing as an approach to increasing the acceptance of food among children with developmental disabilities. Participants were generally young children with developmental disabilities other than ASD. Unlike children with ASD, children with developmental disabilities often required additional supports for physical conditions linked to food refusal or selectivity. In addition to more established single-case designs, researchers employed combined designs in evaluating the effectiveness of high-probability sequencing. Procedures were frequently administered by researchers in home or clinical settings over a brief number of sessions. Although slightly over half of cases met WWC (2017) quality indicators, these cases often failed to demonstrate a functional relation or were indicative of a limited effect of high-probability sequencing. Consequently, we find that the research provides, at best, limited support for the use of high-probability sequencing in addressing feeding disorders.

Findings are largely consistent with those of previous syntheses. As in much of the literature concerning feeding disorders (Ledford et al., 2018; Silbaugh et al., 2016), studies identified in the current review typically did not include data related to maintenance, generalization, social validity, or implementation fidelity. The absence of such information undermines conclusions regarding the significance of outcomes and the influence of procedural protocols on changes in food acceptance. As in previous reviews, many studies did not report key participant characteristics or satisfy standards of quality (Silbaugh et al., 2016).

In contrast to our findings, Ledford and colleagues (2018) found that 73% ($n = 9$) of methodologically sound cases featuring high-probability sequencing demonstrated a functional relation. Discrepancies are likely due to variations in search procedures and the previous review's exclusive focus on children with ASD, which resulted in the exclusion of 53% ($n = 8$) of the studies presently evaluated. Although insufficient to suggest a differential effect of high-probability sequencing based on diagnosis, studies supporting the effectiveness of high-probability sequencing generally involved children with ASD (see Table 3). Our exclusion of master's theses may also have contributed to the difference in findings.

Study outcomes suggest that high-probability sequencing is much less effective than other approaches, which improve food acceptance in as many as 75% of available cases involving children with ASD ($n = 58$; Ledford et al., 2018). This finding may be due to our inclusion of more recent research featuring children with ASD that either did not meet quality standards or did not demonstrate the effectiveness of high-probability sequencing (e.g., Silbaugh & Swinnea, 2018; Trejo & Fryling, 2018). The disparity may also have resulted from our inclusion of studies featuring children with developmental disabilities and comorbid physical conditions related to food refusal. In that sense, this review found that high-probability sequencing was not effective for children who required the greatest level of support. This may not be indicative of an unsuitability of behavioral intervention for children with developmental disabilities, however, as many of these participants responded to escape extinction (e.g., Dawson, 2001; Dawson et al., 2003; Patel et al., 2006). Moreover, authors in some instances (e.g., Patel et al., 2006) reported that some children with severe developmental disabilities responded to high-probability sequencing. Nonetheless, including studies featuring children with severe developmental disabilities resulted in more modest conclusion regarding the effectiveness of high-probability sequencing relative to reviews focusing on ASD (e.g., Ledford et al., 2018).

The disaggregation of combined designs, which resulted in the concentration of a high proportion of cases in certain studies (e.g., Dawson, 2001), offers an additional explanation for our results. Specifically, cases with negative findings often appeared in studies featuring complex designs where the physical profile of participants represented an important consideration (e.g., short bowel syndrome) or problem behaviors potentially minimized the effect of the procedure (e.g., Dawson, 2001). Although little consensus exists regarding the syntheses of combined designs, another approach may have reduced the influence of individual studies. Even when interpreted at the study level, however, the literature does not provide compelling support for high-probability sequencing for children with ASD or other developmental disabilities.

The application of the WWC (2017) quality indicators likely influenced results. Due to their emphasis on easily observed study factors that are (a) highly related to internal validity and (b) unlikely to be influenced by page space restrictions, the WWC indicators have several advantages over alternative quality metrics. Nonetheless, the indicators provide limited guidance for the interpretation of combined designs, where the presence of overlapping design characteristics might constitute a potential threat to validity. As demonstrated by Silbaugh et al. (2016), more comprehensive quality standards (e.g., Council for Exceptional Children; Cook et al., 2014) would have resulted in fewer studies meeting criterion for analysis. Analyzing studies featuring nonconcurrent designs would likewise have influenced findings. We therefore encourage future inquiry into the influence of quality assessment on the results of syntheses, as the use of different selection criteria may result in different conclusions (King, Davidson, Chitiyo, & Apple, 2018). Regardless, we find a skeptical view of high-probability sequencing for food acceptance is warranted given (a) the few studies supporting its effectiveness in the absence of other procedures and (b) the cases that suggest high-probability sequencing is ineffective.

Limitations

This article has several notable limitations. The search did not attempt to incorporate all published or unpublished material. We refrained from incorporating sources for which we were unlikely to locate all records (e.g., master's theses) because the partial inclusion of these sources may have biased results (King et al., 2018). This review also focused on food acceptance rather than problem behaviors or other variables. That is, we did not analyze data regarding the effect of high-probability sequencing on reducing problem behavior. This information was not included due to (a) its absence in many studies and (b) the relevance of acceptance to the feeding context.

PND has documented limitations in terms of identifying data trends and in reflecting the impact of the independent variable under certain circumstances. Alternatives to PND may have provided a more precise depiction of outcomes. We nonetheless feel that the use of PND was appropriate as many alternative nonoverlap and statistical effects (a) share similar shortcomings (Carter, 2013), (b) have limited applicability to the designs featured in this review (e.g., alternating treatments designs), or (c) require a higher number of data points that have been traditionally considered adequate. We further find that visual analysis provides a meaningful assessment of effect that supplements the limitations of PND and is aligned with the intent of this review.

Implications for Practice

Despite our central finding, we acknowledge that high-probability sequencing has several practical benefits, including ease of use and applicability to a range of behaviors. For practitioners who may consider an "off-label" usage of this procedure for food acceptance, we offer several caveats. As in all instances of feeding disorders, the use of behavioral methods should not be attempted until a full medical evaluation has been completed. Practitioners should then limit the use of high-probability sequencing to children with less severe feeding disorders unassociated with the physical conditions that limited consumption or problem behavior. This is not due to evidence that high-probability sequencing is ineffective for these populations, as the evidence regarding the practice is generally insufficient; rather, children with the most significant needs should receive empirically validated multidisciplinary treatment as soon as possible. In accordance with the guidance of Lipschultz and Wilder (2017), we further recommend that practitioners employ high-probability sequencing in combination with other supports and provide children with reinforcement following compliance with low-probability requests.

Given the range of procedures featured across studies, definitive recommendations regarding optimal variants of high-probability sequencing are not possible. Nonetheless, the evidence is sufficient to provide tentative guidance. Practitioners should preface high-probability sequencing with assessments designed to ensure the validity of high-probability requests (e.g., preference assessments). As researchers typically administered high- and low-probability tasks on ratios of 3:1, practitioners would be advised to adhere to this convention. Finally, evidence does not appear to favor food-consumption or task-related high-probability sequences. The decision to use either sequence type may be unimportant unless satiation (i.e., the child is no longer hungry following food consumption) is a concern. However, we do not recommend using food-related task sequences involving the targeted food because evidence suggests sequences integrating behaviors topographically similar to low-probability behaviors are ineffective (Lipschultz & Wilder, 2017). In addition, studies involving food selectivity indicate that such sequences either (a) fail to increase acceptance of low-probability foods (e.g., Silbaugh & Swinnea, 2018) or (b) require extensive fading procedures (e.g., Penrod et al., 2012).

Directions for Future Research

Future research concerning high-probability sequencing must address the following critical question: *For whom is high-probability sequencing effective*? Currently, professionals seeking guidance from research must rely on narrative descriptions of participants often lacking in critical details (e.g., IQ, verbal ability). This review suggests the designations of "food refusal" or "food selectivity" do not predict the impact of care. Whereas children exhibiting refusal and receiving their calories through enteral tube feedings responded to the procedure in some studies (e.g., Patel et al., 2007; Patel et al., 2006), some participants exhibiting selectivity did not to respond to high-probability sequencing or more intensive supports (Silbaugh & Swinnea, 2018; Silbaugh, Swinnea, & Falcomata, 2018). This may reflect the imprecision of the food selectivity assignation. Similarly, small studies provide limited insight into the individuals with health constraints or behavior problems who may respond to intervention. Expanding the research base concerning the use of high-probability sequencing for feeding disorders in terms of the number, quality, and type of studies conducted may permit sophisticated meta-analyses concerning factors related to child outcomes.

We believe there are two distinct lines of research with the potential to improve the initial selection of interventions. Large-scale studies, in which scores on inventories of food selectivity, as well as IQ and other factors, are examined as moderators, could assist practitioners in selecting care options in advance of treatment. The relationship between cognitive ability and receptive language repertoires of participants and the effectiveness of high-probability sequencing could be addressed through this line of inquiry. This research, though important, may fail to yield immediate dividends due to the insensitivity of standardized measures. Such work must therefore be supplemented by ongoing research that provides insight into specific child, environmental, and intervention variables that influence outcomes. This research has the potential to improve the judgment of professionals in the field and increase their responsiveness to the needs of children.

Due to the mixed findings across studies, high-probability sequencing requires further evaluation. In addition to comparing high-probability sequencing with other approaches or examining the impact of procedural

variations, there remains a need for rigorous work demonstrating the effectiveness of high-probability sequencing in isolation. Future studies should also expand the range of alternative procedures used as a basis of comparison. Many of the existing studies compare high-probability sequencing with escape extinction (Silbaugh et al., 2016). To make an analogy to weight loss, this is akin to comparing the effects of a sugar-free diet with bariatric surgery. Researchers should therefore consider comparing high-probability sequencing with similar nonrestrictive approaches. Successful use of high-probability sequencing, which results in the child consuming an unaltered food, may result in more rapid acquisition of unassisted food acceptance when compared with approaches involving food modification (e.g., simultaneous presentation). Additional areas of inquiry include generalization and maintenance of gains associated with high-probability sequencing relative to alternatives.

Current methods of research evaluation may not be appropriate for many of the studies that feature high-probability sequencing. Combined designs and, to a lesser extent, alternating treatments designs prominently featured in this literature base are largely incompatible with methods of analysis that typically emphasize A-B-A-B or multiple baseline across participants designs (Gast & Ledford, 2014). Consequently, the use of such designs warrants the use of less optimal forms of analysis. Quality indicators also provide limited guidance for combined designs, where the presence of overlapping design characteristics alone might constitute a threat to internal validity. We therefore encourage researchers to continue to examine the quality assessment and interpretation of less common designs.

Similarly, additional standards regarding the incorporation of null findings may be needed for instances in which studies demonstrate the ineffectiveness of a practice (Silbaugh & Swinnea, 2018). Such studies are often not published despite their potential to contribute valuable knowledge to the field (Kratochwill, Levin, & Horner, 2018). Authors often circumvent this restriction by abandoning ineffective techniques and employing alternatives. This increases the likelihood that participants will benefit and produces data indicative of a functional relation. However, this also eliminates a definitive outcome regarding the effectiveness of the initial procedure. Guidelines for the incorporation of null findings are therefore necessary. These changes would assist practitioners and researchers in assessing the efficacy of high-probability sequencing and other supports for children with developmental disabilities.

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Exploring Predictors of Community Participation Among Young Adults with Severe Disabilities

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Abstract

A secondary analysis of data from the National Longitudinal Transition Study–2 (NLTS2) was conducted to examine predictors associated with improved postschool community participation of young adults with severe disabilities. Multidimensional item response theory was used to establish criterion and predictor constructs and examine predictive relationships between these constructs. Results identified two outcome constructs (community involvement, social engagement) and four predictors (functional skills, classroom behaviors, participation in social networks, access to vocational programs) establishing good model fit. Participation in social networks while in school was a strong predictor of both community involvement and social engagement. Functional skills of young adults predicted postschool community involvement. Implications for future research and practice promoting and supporting community participation are discussed.

Keywords

community participation, severe disability, secondary analysis, NLTS2

Critical postschool outcomes for students with severe disabilities include not only postsecondary education and employment but also active participation in the community. Researchers have long emphasized the indispensable role of community participation as an important aspect of adulthood for individuals with severe disabilities (Carter, Harvey, Taylor, & Gotham, 2013; Dean, Fisher, Shogren, & Wehmeyer, 2016; Rogan & Walker, 2007). Indeed, individuals with severe disabilities who participate in the community have more resources and opportunities to accomplish their desired adult roles primarily because of stronger community networks (Braddock, Hemp, Tanis, Wu, & Haffer, 2017). Such findings suggest community participation is of paramount importance toward the achievement of inclusive adult outcomes (Myers, Ager, Kerr, & Myles, 1998).

However, relatively little is known about the community participation of young adults with severe disabilities. Most research has been descriptive in nature and focused on individuals with less intensive support needs (Cleaver, Ouelette-Kuntz, & Sakar, 2010). Among studies that have examined postschool outcomes for students with severe disabilities, most are related to employment (Bouck, 2012; L. Brown, Shiraga, & Kessler, 2006; Carter, Austin, & Trainor, 2012) or postsecondary education and training (Grigal, Hart, & Migliore, 2011). Less attention has focused on the community engagement, participation, and social

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networks of youth and young adults with severe disabilities (Amado, Stancliffe, McCarron, & McCallion, 2013; Tint, Maughan, & Weiss, 2017). To better understand the unique transition supports and services needed for young adults with severe disabilities, additional research is needed to examine critical factors associated with community participation as a postschool outcome.

Community participation has been described as representing both physical presence and meaningful involvement in community events and organizations (O'Brien & Blessing, 2011). In an early conceptualization, O'Brien and O'Brien (1990) defined community participation as when individuals with disabilities are present and engaged in everyday adult activities, leading to a network of personal relationships. Hammel et al. (2008) expanded this definition by incorporating additional elements including acceptance as a member of the community, involvement in adult community activities, and contributions to one's community. Also considered important by Hammel et al. was the opportunity for building mutual respect, as well as engaging in reciprocal personal relationships sustained by formal and informal supports. In sum, research has suggested several indicators of the depth and quality of community participation, including (a) frequency of community visits (i.e., community presence), (b) type of involvement in adult activities (i.e., community involvement), and (c) sense of belonging to social networks (i.e., social engagement; Levasseur, Richard, Gauvin, & Raymond, 2010; Milner & Kelly, 2009; O'Brien & O'Brien, 1990). In the present study, we used these three dimensions to examine community participation among young adults with severe disabilities as they transition from school to adulthood.

Unfortunately, few investigations have focused on factors associated with community participation for young adults with severe disabilities. However, several studies have identified variables that could be considered as related to positive community participation. For example, daily living and self-care skills have been associated with independent living outcomes (Test et al., 2009). In addition, some studies have found that students with severe disabilities who possess stronger communication and self-care skills are more involved in social activities (Shattuck, Orsmond, Wagner, & Cooper, 2011). Similarly, studies have identified communication skills, self-care skills, and inclusion in general education as predictors of postschool employment (Carter, Austin, & Trainor, 2011; Migliore, Mank, Grossi, & Rogan, 2007). Such factors may also influence community participation. In addition, family expectations have been identified as predictive of other postschool outcomes for students with intellectual disability (Doren, Gau, & Lindstrom, 2012). Given the role families play in supporting their children to engage in a wide range of community events outside of school, it is possible their expectations for inclusive community involvement could influence postschool community participation. However, few studies have examined the relation among these factors and community participation. Studies exploring individual, family, and school factors associated with improved community participation for this population are needed to enhance transition practices and programs fostering positive adult outcomes.

The purpose of this study was to (a) develop an empirical model of community participation for young adults with severe disabilities and (b) examine factors associated with postschool community participation among young adults with severe disabilities. Through a secondary analysis of the extant National Longitudinal Transition Study–2 (NLTS2) data set, we were interested in understanding how predictor constructs consisting of individual, family, and school factors influenced the established community participation outcomes across three areas: community presence, community involvement, and social engagement. We hypothesized that young adults with functional, self-care, social, and communication skills would be more likely to be present and involved in community activities and roles. We also expected young adults whose parents reported greater involvement in transition planning and higher expectations for the future would be more engaged in the community. Finally, we hypothesized that young adults who were included in general education and involved in social networks while in high school would be more likely to experience higher levels of community participation after exit from school. Specific research questions were as follows:

Research Question 1: What are the characteristics of community participation outcomes of young adults with severe disabilities, as measured from the NLTS2?

Research Question 2: Can specific community participation outcomes and predictor constructs be established?
Research Question 3: To what extent do predictor constructs predict the community participation outcomes of young adults with severe disabilities?

Method

NLTS2

Funded by the U.S. Department of Education, the NLTS2 was designed to provide information about postschool outcomes of young adults with disabilities. The NLTS2 obtained a nationally representative sample of 11,280 teenagers with disabilities, aged 13 to 16 years old, when the study launched in 2000. The study continued over a 10-year period through five additional waves of data collection. In this study, we used the *Parent–Youth Interview* (PYI) to identify variables associated with individual and family characteristics, nonschool activities, and activities after high school. We used the *Student's School Program Survey* (SPS) to identify information about students' educational programs, transition planning experiences, school performance, and instructional practices. School staff who were most knowledgeable about the students' overall school programs completed the survey. We used the *School Characteristic Survey* (SCS) to identify the characteristics related to schools, such as grade levels served, public or private, size, and number of students. We used *Transcripts* for information about students' course-taking patterns, grades, and attendance.

Participants

A comprehensive multistage sampling analysis was used to identify participants with severe disabilities. First, we identified students with specific disability categories identified within the Individuals with Disabilities Education Improvement Act (IDEA; 2004) that are generally associated with severe disabilities (i.e., intellectual disability, autism, multiple disabilities, and deaf–blindness; Snell & Brown, 2006). This yielded an initial sample size of 2,880 (all sample sizes rounded to the nearest 10). Second, because of the wide range of intellectual and functional capabilities existing within these four categorical groups, we established a level of severity of disability by using items from the SPS. We included participants who met either of the following two criteria: (a) assigned as having moderate/severe intellectual disability (npr1d2b) or (b) eligible for alternate assessment of academic achievement, a designation intended for only 1% of the special education population for whom regular state assessments are deemed inappropriate (npr1A5a; Carter et al., 2011). This process identified 550 participants with moderate/severe disabilities and excluded 560 identified as having mild disabilities. However, due to low response rates in the SPS, we could not establish severity of disability among the remaining 1,770 from the original sample. Therefore, as a third step in our sampling process, we conducted a best subset logistic regression analysis to estimate severity of disability for the remaining sample. Based on model fit statistics (Mallow's C_p, Akaike's information criterion [AIC], and the Bayesian information criterion [BIC]), six predictor variables associated with severity of disability were identified from the PYI, SPS, and Transcripts in Wave 1: (a) the percentage of time spent in academic general education classes, (b) the ability to straighten up one's room, (c) the number of domains affected by disability, (d) belonging to an extracurricular school group, (e) the level of curriculum modification, and (f) parents' expectations of the student attending a postsecondary school. Using regression coefficients with a cutoff value of .50, this process identified an additional 130, thus identifying a total of 680 participants with severe disabilities. Fourth, we used final inclusion criteria that required participants to be enrolled in school when the data were collected in Wave 1, 2, or 3, and have graduated from school by Wave 3, 4, or 5 when participants were between 19 and 25 years old. This resulted in a final sample of 470 young adults with severe disabilities consisting of 120 young adults with intellectual disability, 170 with autism, 160 with multiple disabilities, and 20 with deaf–blindness (see Table 1).

Table 1. Demographic Information.

Variables	n^a	%
Race/ethnicity		
White	300	63.8
African American	100	20.5
Hispanic	60	13.2
Others	10	2.5
Family income		
US$25,000 or less	150	31.1
US$25,001-US$50,000	130	26.9
More than US$50,000	160	33.7
Gender		
Male	310	67.0
Female	160	33.0
Disability category		
Intellectual disability	120	24.7
Autism	170	36.2
Multiple disabilities	160	33.9
Deaf–blindness	20	5.1
Age when school data were collected		
13	20	4.7
14	90	18.8
15	130	27.7
16	150	31.6
17	80	17.3

Note. $N = 470$.
[a]Unweighted: Rounded to the nearest 10.

Community Participation Outcomes

We examined community participation outcomes by empirically validating our three theoretical constructs: (a) community presence, (b) community involvement, and (c) social engagement. As the NLTS2 was not specifically established to provide a picture of community participation of young adults with severe disabilities, the community participation outcomes consisted of composite variables from the PYI in Wave 5, with additional unique cases selected from Wave 4 if the data from Wave 5 were missing. In addition, responses were combined from parents if the young adults were not surveyed. All the items were categorical variables with binary responses. The range of missing values was 10.4% to 23.5%, and items with missing values of greater than 80% were excluded. To establish validity, we conducted a factor analysis, and eliminated items showing standard factor loadings below .30 or nonsignificant factor loadings ($p > .01$).

The "community presence" construct (10 items) identified locations in which young adults with severe disabilities participated in specific settings when they were not working or attending school. The 10 community settings were mall/coffee shop, outdoor physical activity settings, indoor physical activity settings, restaurants, bars/clubs, church, travel, camp/fishing/boating, health service facilities, and entertainment venues. The "community involvement" construct (eight items) identified whether young adults were involved in community activities related to meaningful adult roles. Two items asked whether they participated in any community activities or any volunteer/community services within the past 12 months. Six items related to adult roles: voting, driving, having a savings/checking account, possessing a credit card, being gainfully employed, and being enrolled in postsecondary schools. Finally, the "social engagement" construct (three items) identified whether the young adults were engaged in personal relationships, such as individual and group social activities, organized group activities, and friendships (supplemental tables are available by request from the corresponding author).

Predictor Constructs

We examined predictor constructs across four domains: (a) five individual domain constructs, (b) three family domain constructs, (c) five school domain constructs, and (d) two community domain constructs. The variables of predictor constructs were identified from multiple sources including the PYI, SPS, SCS, and *Transcripts* in Waves 1 and 2, with additional unique cases selected from Wave 2 if the data from Wave 1 were missing. Items were categorical with binary or ordinal response types. The range of missing values was 1.3% to 27.1% of items, with missing values of greater than 80% excluded. To establish validity, we conducted a factor analysis, and eliminated the items showing standard factor loadings below .30 or nonsignificant factor loadings ($p > .01$). Supplemental tables detailing these constructs can be requested from the corresponding author.

In the individual domain, the "functional skills" construct (nine items) included self-care and household responsibility skills of young adults with severe disabilities: telling time, reading common signs, counting change, using the telephone, dressing oneself, feeding oneself, fixing meals, doing laundry, and straightening up one's own room. The "social skills" construct (five items) measured social interactions and behavior. The "communication skills" construct (six items) measured whether young adults could converse and understand what people were saying. The "classroom behaviors" construct (six items) included the frequency of classroom behaviors.

In the family domain, the "involvement in education" construct (five items) measured how frequently the parents attended general school meetings, school or class events, parent/teacher conferences, and Individualized Education Program (IEP) meetings. The "outcome expectations" construct (four items) included expectations about attending postsecondary education, getting a driver's license, living away from home without supervision, and finding gainful employment. The "family support" construct (one item) measured how frequently parents helped with their child's homework.

In the school domain, the "inclusion" construct (one item) measured the percentage of time spent in general classrooms. The "access to general curriculum" construct (three items) measured whether the young adults attended math, English, and science courses. The "accommodation" construct (11 items) included accommodations like modified or alternative tests, additional time for tests, and more frequent feedback. The "participation in social networks" construct (three items) measured the primary goals specified for social skills improvement, participation in volunteer/community services, and social activities outside of the classroom and school. The "access to vocational programs" construct (seven items) measured primary goals in a written assessment of career skills or interests, job searching, job shadowing, work exploration, job skills training, and job coaching.

Analytic Procedures

To determine characteristics of community participation outcomes of young adults with severe disabilities, as measured from the NLTS2 (Research Question 1), we completed descriptive analyses for the three community outcome constructs: community presence, community involvement, and social engagement. We conducted cross tabulation and descriptive statistics using SPSS 18.0.

Prior to examining whether specific community participation outcomes and predictor constructs could be established (Research Question 2), we evaluated latent construct structures by conducting multidimensional item response theory (MIRT), an extension of item response theory (IRT), to examine the multidimensionality of the latent variables. Given that the majority of variables in this study were binary or ordinal responses, factor analysis procedures that are commonly used for latent structure examination were inappropriate. A drawback to using categorical variables is that the linear association of item responses is unclear, and a continuous normal distribution cannot be established (Woods & Edwards, 2011). To prevent bias leading to attenuated correlations and underestimated factor loadings (DiStefano, 2002), IRT can be used as an alternative method to gauge relations between latent factors. IRT overcomes violations of scale and distributional assumptions when categorical variables are used in lieu of factor analyses (Osteen, 2010). MIRT allows for assumptions of more than one dimension underlying responses as well as for differences between individuals (Reckase, 2009), thereby allowing for estimations of each hypothesized construct

analyzed separately while also accounting for correlations between dimensions. In this way, MIRT provides greater clarity in understanding multiple dimensions, thus resulting in more reliable item estimations and population parameters (Ackerman, Gierl, & Walker, 2003). Therefore, MIRT can serve for confirmatory or exploratory purposes of measurements (Marvelde, Glas, Landeghem, & Damme, 2006).

To answer Research Question 2, we tested a model fit to confirm the multidimensionality of the latent constructs with 96 selected items categorized across the 17 dimensions described previously. We conducted unidimensional analyses examining each construct's robustness with item-level parameters, with a criterion of a minimum of a .30 standard factor loading (T. A. Brown, 2006; Kline, 2011). Population means were constrained to zero so that all item parameters could be estimated. A second step tested the multidimensionality of the constructs and confirmed a final model. AIC and BIC parameters were used to ensure competing models were not nested within each other, and the lowest AIC and BIC parameters among the models indicated the best model fit (Allen & Wilson, 2006).

To determine the extent to which predictor constructs predict the community participation outcomes of young adults with severe disabilities (Research Question 3), we tested the relations between the predictor constructs and community participation outcomes. MIRT modeling allowed for latent regression analyses to estimate item parameters. The correlations between predictor and community participation outcome constructs were converted to predictive paths, with statistical significance tested at an alpha level of .01. The marginal maximum likelihood method was used to estimate predictive influence (Johnson, 2007) using Mplus (Version 6.0). Prior to data analysis, we identified missing data caused by attrition and nonresponses, and used the full information maximum likelihood method to reduce potential bias (Little & Rubin, 2002).

Results

Descriptive Results Describing Community Participation Outcomes

Table 2 presents the descriptive characteristics of the three post–high school community participation constructs. In terms of community presence, less than one fourth of the young adults spent time in outdoor physical activities such as playing sports, jogging, swimming, biking, and skating. The second community activity most often reported was attending entertainment and events (13%). Slightly less than 10% of young adults were reported to have spent time in malls/cafes/coffee shops, and church, in the past week. Less than 5% of young adults spent time in community settings such as an indoor gym, bars/clubs, outdoor activity places, and medical services. None were reported to have spent time eating in restaurants or outside the home during the week prior to data collection.

For community involvement, half of the young adults were reported to have participated in some type of out-of-school community activity in the past 12 months. We found that almost one third of young adults had volunteered in their community. Among the indicators representing postschool adult roles, 61% had a savings or checking account, 38% were employed at the time data were collected, and 5% had enrolled in a form of postsecondary education.

For social engagement, we found that half of the young adults were reported to have been invited to social activities with friends in the past 12 months, and 11% had spent time with friends in the past week.

Construct Development and Modeling

To address our second research question, we conducted an IRT analysis with a logical sequence of analyses that included (a) unidimensional analysis of each construct, (b) multidimensional analysis of criterion and predictor constructs, and (c) operationalizing the finalized model. The first step investigated item-level parameters of each construct, confirming 13 constructs consisting of 58 indicators (all factor loadings were required to be above .30, $p < .01$). The second step investigated the best model for the theorized individual, family, school, and community domains. Based on AIC and BIC values, a total of nine constructs were confirmed. Two constructs were confirmed within community participation outcomes: "community involvement" and "social engagement" constructs (AIC = 4,317.513, BIC = 4,403.431), with the third area, "community presence" dropping from the model. The individual domain predictors construct resulted in two

Table 2. Descriptive Information Pertaining to Community Participation Outcome Variables.

Constructs	Variables	Yes (%)	No (%)	n^a
Community presence	Doing outdoor physical activities: playing sports, jogging, swimming, biking, skating	80 (22)	290 (78)	100
	Attending entertainment/events	50 (13)	310 (87)	110
	Going to church/church activities	30 (9)	330 (91)	110
	Shopping/hanging out at the malls/cafes/coffee shops	30 (8)	330 (92)	360
	Doing indoor physical activities: exercising, working out, going to the gym	10 (3)	350 (97)	110
	Traveling/going to a camp/vacation	10 (3)	350 (97)	110
	Going to bars/clubs/partying	5 (1)	350 (99)	110
	Getting therapies, medical attention, visiting doctor, recovering from illness/injury	3 (1)	360 (99)	110
	Doing other outdoor activities: camping/fishing/boating/riding ATVs/hunting/shooting	2 (1)	360 (99)	110
	Going out to eat/going to restaurants/eating out	0 (0)	360 (100)	360
Community involvement	Have a savings or checking account	230 (61)	140 (39)	370
	Participated in an out-of-school group activity (community activities) in the past 12 months	210 (50)	210 (50)	420
	Worked for pay during the last 2 years	160 (38)	250 (62)	410
	Registered to vote	130 (35)	240 (65)	370
	Participated in volunteer/community service in the past 12 months	110 (29)	260 (71)	370
	Have charge accounts in his or her own name	40 (11)	320 (89)	360
	Have a driving license or learners permit	40 (11)	330 (89)	370
	Took classes from a college in the last 2 years	20 (5)	390 (95)	410
Social engagement	Invited to social activities with friends in the past 12 months	190 (50)	190 (50)	380
	Spent time visiting or playing with friends	40 (11)	320 (89)	360

Note. $N = 470$.
[a]Unweighted: Rounded to the nearest 10.

constructs: "functional skill" and "classroom behavior" (AIC = 10,184.984, BIC = 10,371.665). For the family domain, "involvement in education" and "outcome expectation" constructs emerged (AIC = 6,988.874, BIC = 7,129.922). Finally, the school domain included "participation in social networks" and "access to vocational program" as the two constructs that emerged from the model (AIC = 3,636.854, BIC = 3,707.414). One construct emerged as a single construct for the community domain (AIC = 1,661.997, BIC = 1,694.799).

The final modeling approach examined combinations of the latent constructs to determine the best model fit using AIC and BIC parameters and a step-by-step approach (Allen & Wilson, 2006). A total of 255 models were generated representing all possible combinations of all predictor and outcome constructs. The final model included eight empirically verified constructs—two outcome constructs, "community involvement" and "social engagement," and six predictor constructs representing (a) individual characteristics: functional skills and classroom behaviors; (b) family characteristics: involvement in education and outcome expectation; and (c) school domain: participation in social networks and access to the vocational program. All showed good model fit (AIC = 18,517.934, BIC = 18,928.843; see Model 11 in Table 3; a supplemental table is available by request from the corresponding author).

Predicting Postschool Community Participation Outcomes

Our third research question explored the extent to which the individual, family, and school constructs predicted community participation outcomes representing the final outcomes of community involvement and social engagement. We used regression analyses to investigate the predictive influence of

Table 3. Analysis of Best and Near-Best Models and Finalized Model.

Model	Constructs	AIC	BIC
1	CI, SE, FSS, PSN	13,634.048	13,899.687
2	CI, SE, IE, CB	11,487.075	11,748.158
3	CI, SE, OE, CB	10,778.646	11,015.109
4	CI, SE, IE, AVP	10,444.058	10,680.398
5	CI, SE, OE, AVP	9,723.731	9,935.303
6	CI, SE, OE, PSN	9,483.355	9,678.434
7	CI, SE, PSN, AVP	7,927.656	8,101.982
8	CI, SE, FSS, PSN, IE	17,836.448	18,205.852
9	CI, SE, FSS, PSN, CB	16,628.707	16,977.357
10	CI, SE, OE, AVP, IE	13,964.697	14,284.293
11	**CI, SE, FSS, PSN, CB, AVP**	**18,517.934**	**18,928.843**

Note. The best model is confirmed in boldface. AIC = Akaike's information criterion; BIC = Bayesian information criterion; CI = community involvement; SE = social engagement; FSS = functional skills; PSN = participation in social networks; IE = involvement in education; CB = classroom behaviors; OE = outcome expectation; AVP = access to the vocational programs.

specific predictor constructs (individual, family, and school characteristics) on the two established post-school community participation outcomes. As shown in Table 4, two predictors emerged as positive, strong predictors of the "community involvement" (functional skills and participation in social networks). Only one predictor construct (participation in social networks) had a positive and strong influence on "social engagement."

The results indicated that 83% of the variance in the "community involvement" construct was explained by the "functional skills" and "participation in social networks" constructs. Specifically, the "functional skills" construct had a significant effect on the "community involvement" construct ($b = 0.872$, $B = 0.354$, $p < .01$). Likewise, the "participation in social networks" construct showed a significant effect on the "community involvement" construct ($b = 1.299$, $B = 0.528$, $p < .01$). The analysis also found that 23% of the variance in the "social engagement" construct was explained by "participation in social networks." The "participation in social networks" construct was a significant predictor of the "social engagement" construct ($b = 0.494$, $B = 0.431$, $p < .01$).

Discussion

We sought to develop a model of community participation for young adults with severe disabilities. Given the paucity of research focused on this critical dimension of adulthood, the results from this study broadens the field's understanding of factors associated with community involvement and social engagement among young adults with severe disabilities. Unfortunately, very few young adults with severe disabilities were reported to be actively present in community activities. In fact, because of the extremely limited participation, the initial outcome construct, community presence, was not included in the final model, leaving only the domains of community involvement and social engagement. For the most part, less than half of the young adults were consistently reported to be involved in community and social activities with peers.

We were able to develop a two-factor model of community participation consisting of the community involvement and social engagement constructs. Within the community involvement domain, we were able to use indicators representing levels of social activities (e.g., participation in group activities and volunteering), as well as adult-outcome roles and responsibility associated with community involvement (e.g., voting, having a bank account, working). However, the descriptive results revealed that within the community involvement domain, engagement in several of the indicators rarely occurred. For example, 35% of young adults were registered to vote, and only 11% had a charge account in their name. Even more concerning is that only 38% of young adults had worked for pay

Table 4. Parameter Estimates for the Model Predicting Community Participation.

Variables	*b*	*SE*	*B*	*p*	Adjusted R^2
Community involvement					
Functional skills	**0.872**	**3.179**	**0.354**	**<.01**	.83
Classroom behaviors	0.261	1.748	0.106	.080	
Participation in social networks	**1.299**	**6.036**	**0.528**	**<.01**	
Access to vocational programs	0.371	2.288	0.150	.022	
Social engagement					
Functional skills	−0.182	−0.969	−0.159	.333	.23
Classroom behaviors	−0.097	−0.789	−0.085	.430	
Participation in social networks	**0.494**	**3.499**	**0.431**	**<.01**	
Access to vocational programs	0.262	1.582	0.229	.114	

Note. $N = 470$. Significant predictors are in boldface. *b* = raw coefficient; *SE* = standard error.

within the past 2 years, and 5% had enrolled in postsecondary educational experiences. The social engagement outcome domain included two indicators representing amount of time spent with friends. Our findings highlight the need to develop stronger understandings of how young adults with severe disabilities access and engage in a wide range of inclusive social activities after they exit from high school.

Finally, we were interested in identifying factors associated with community participation outcomes and determining whether student characteristics played a contributing role in predicting participation. Two findings warrant further discussion: (a) Young adults with higher functional skills were more likely to be involved in community activities including adult role activities and (b) young adults with more opportunities to access social networks while in school were more likely to engage in post–high school community involvement.

Community Participation Among Young Adults with Severe Disabilities

Presence within the community is often regarded as a precondition of higher levels of involvement and more robust social inclusion (Simplican, Leader, Kosciulek, & Leahy, 2015). Unfortunately, our study found substantial discontinuity between school and community life as has been previously noted for young adults with severe disabilities during the early stages of adulthood (McCarron et al., 2011). Specifically, young adults rarely participated in community settings and exhibited low levels of engagement in community activities. This finding is consistent with other literature identifying a shortage of access and opportunities to the community for individuals with disabilities (Radermacher, Sonn, Keys, & Duckett, 2010). The results from this study support prior concerns that social isolation may be evident as young adults with severe disabilities exit school (Levasseur et al., 2010).

To some extent, distinguishing between the community involvement and social engagement constructs is difficult because activities occurring in social contexts typically take place through interactions with others. Oftentimes, the concept of community participation has been used interchangeably with social engagement (Hammel et al., 2008; Levasseur et al., 2010). Indeed, we found in this study that the community involvement and social engagement constructs were highly intercorrelated. This lends some credence to the contention that community activities and personal interactions are intertwined. In this study, young adults with severe disabilities were engaged in social interactions mostly with friends, with at least half participating in social activities, getting invitations, or hanging out. However, this study could not differentiate the quality of the social interactions and with whom interactions were occurring, given the limited types of variables available. It is important to note that research has long established that individuals with severe disabilities experience difficulties in building and maintaining social interactions leading to friendships (Howlin, 2000; Milner & Kelly, 2009). Future research is needed to inform how transition practitioners can support and expand social networks leading to postschool success.

Predictors of Community Participation of Young Adults with Severe Disabilities

Participation in a social network was a predictor of both postschool community involvement and social engagement. Specifically, if young adults were reported to have participated in a larger social network through school activities, volunteering, or community work while still in school, then they were more likely to be engaged in a variety of community activities postschool and to engage in adult roles. This lends support to the value of developing social network interventions to increase social engagement among adolescents with severe disabilities (Carter, 2018). In addition, levels of participation in a social network while in high school appeared to be connected to higher levels of social relationships postschool. These findings add evidence that having social networks in high school may affect community involvement and social engagement. Inclusive educational placements—which provide access to social networks—have also been found to maintain a positive effect on postschool outcomes (Carter et al., 2012).

Our findings suggest the importance of developing social networks while adolescents are in high school. Social networks can provide opportunities to engage in social activities, volunteering, and community services, as well as to get to know people and maintain relationships with others (White, Simpson, Gonda, Ravesloot, & Coble, 2010). Recently, strengthening social capital has been emphasized as a way to improve community engagement of youth with disabilities (Trainor, Morningstar, Murray, & Kim, 2013). Social capital has been described as the formal and informal networks, which provide instrumental support and access to information and resources necessary for transition success (Trainor, 2008). Therefore, receiving sufficient instructional opportunities and experiences to expand and build social networks should be critically considered in schools specifically with regard to transition planning with students with severe disabilities.

We found that functional skills were a predictor of postschool community involvement, but social engagement was not. It would appear that the set of functional skills used for this indicator was positively related to certain adult roles associated with our construct of community involvement. In previous research, skills associated with daily living, self-care, self-determination, and social engagement have predicted postschool outcomes and quality of life (Test et al., 2009; Wehmeyer et al., 2012). Our findings support the importance of teaching functional skills needed to ensure all young adults can participate in community involvement outcomes. Furthermore, our findings expand upon prior research regarding the importance of daily living and self-care skills as predictors of community participation.

It is important to note that the functional skills used in this study included self-care and household skills as well as functional cognitive skills (e.g., telling time on a clock, reading and understanding common signs, counting change, looking up telephone numbers in a phonebook and using the telephone). Self-care and household responsibilities have not been used in past studies as part of the constellation of variables associated with functional cognitive skills when identifying specific subgroups of students with more significant support needs. Therefore, this study provides a broader representation of what is included in functional skills, along with positive correlations to at least one construct associated with post–high school community participation.

Limitations

Findings should be interpreted with some caution given several limitations to this study. First, the variables were based on self- and parent-report measures. Self-report measures rely on the honesty of respondents. It is important to note that most variables reflected parents' perspectives and, only to lesser extent, the young adults themselves. Future research should consider examining the perceptions of both young adults and parents on these issues.

Second, the variables selected to examine community participation were limited to those available within the NLTS2 surveys. Moreover, variables related to community presence were time-bound (e.g., what the young adults did during free time within the last week), which differed from the time frame associated with community involvement (i.e., responsibilities occurring in past 12 months). These differences may have skewed the data. Future research is needed that accurately portrays the activities in which students engage, along with the frequency and quality of this engagement. In addition, potentially relevant items describing

community participation (e.g., going out on dates, talking with friends on the phone) were not included in our analysis due to high rates of missing data.

Third, the original construct of community presence (e.g., going out to eat, leisure activities) was negatively correlated with the community involvement construct. This finding was antithetical to our theoretical framework making up the components of community participation (O'Brien & Blessing, 2011). One possible reason could be that the indicators were extremely skewed toward students not being present in the community due to the limited scope of the response (i.e., within the week). Given that the responses for community presence were predominantly negative, there was very little variability among indicators within this construct. Therefore, the results from this study may provide a truncated pattern of community participation of young adults with severe disabilities and should be interpreted with caution.

Fourth, predictors such as inclusion in general education, work experiences, student support, self-determination, and communication skills—long recognized as contributors to successful postschool outcomes—were excluded from this study due to high rates of missing data. Unfortunately, our results offered no support for past research that family- and community-level factors contribute to community participation. Given the significance of family-level factors in supporting successful postschool outcomes for a broader scope of young adults with disabilities (Doren et al., 2012), these results should be interpreted with caution and future research is clearly needed to ascertain the impact of family expectations and engagement on community participation for young adults with severe disabilities.

Implications for Future Research and Practice

This study has several implications for future research and practice, the most significant of which is the importance of extending current research to provide a deeper and more descriptive understanding of community participation among young adults with severe disabilities. Our results related to the construct of community presence illustrated the complexities of research associated with examining access to community activities and resources as a precondition to meaningful social engagement (Balandin, 2011; Bigby & Wiesel, 2011). The lack of community presence found in this study increases the urgency for researchers to better understand the community lives of young adults with severe disabilities as they transition from school to adulthood. Thus, recognizing individuals with severe disabilities as belonging to the community through their involvement and actions as citizens should be a primary focus for supporting young adults to be more engaged in their school and as they transition to their future adult communities. Milner and Kelly (2009) attributed factors affecting one's sense of belonging to include making contributions to society, having higher expectations, building reciprocal relationships, and having a valued social identity, all of which start first by being present in the community. Concepts such as those described by Milner and Kelly will require much nuanced research in the future.

In terms of practice, it is clear that an essential role within special education is to ensure students with severe disabilities are part of the social networks and interactions occurring in schools. This appears to be especially pertinent as adolescents enter secondary schools and prepare for the transition to postschool roles and responsibilities. We found that students' citizenship roles and responsibilities defined in the construct of community involvement were limited. Such findings lend further support for the need to closely align school instructional experiences and ongoing opportunities to make a successful transition from school to community. This will require focused attention not only on the traditional aspects of social skills instruction but to broaden the roles of educators to facilitators and connectors supporting school community participation (Amado et al., 2013).

This study also suggested a broadening of critical postschool outcomes for young adults with severe disabilities. Most studies thus far have focused predominantly on outcomes in the areas of employment, thereby viewing adult outcomes in a truncated and dichotomous manner when considering adulthood for this group of students. To address the specific life circumstances of young adults with severe disabilities, Ferguson and Ferguson (2006) expanded the traditional notions of adulthood by articulating a model of supported adulthood dually emphasizing independence and belonging as critical features of social support programs. Informed by these authors, we recommend school and community practices that may be more likely to lead to higher rates of community engagement: (a) promoting inclusion in the natural context of

school and community; (b) blending informal and formal supports within natural settings to ensure expansion of social networks; (c) ensuring unique preferences of the individual and his or her family are considered when supporting social, recreational, and leisure activities both in school and the community; and (d) maintaining a community-focused perspective when developing transition plans and IEP goals.

Finally, most evidence-based practices have been limited to skill development related to employment and postsecondary education (Test et al., 2009). Our findings highlight the value of pursuing future research focused on the multidimensionality of social inclusion and participation (Simplican et al., 2015). Expanding the meaning of adulthood can shift societal expectations toward young adults with severe disabilities, which was identified as a barrier prohibiting social integration. In this respect, supporting young adults with severe disabilities through inclusive social networks, peer engagement, and community participation while in school is an essential role that educators must play.

The factors associated with increased community participation in this study support further investigations of predictors of postschool success among young adults with severe disabilities. This study brings additional attention to the need to ensure participation in a social network while in school. Given the relation between participation in a social network and community participation outcomes, educators must ensure young adults with severe disabilities receive sufficient opportunities to be engaged in volunteer and community service projects and build social relationships with friends while in school. It is important to note that social networks are more likely to be developed through quality inclusive educational experiences, rather than separate social skill development. Recently identified interventions supporting the development of social networks should be implemented in schools and especially in secondary schools (Carter, 2018). Although efforts are being made to increase social networks in both school and the community, these practices are not widespread (Fisher & Shogren, 2016; Hochman, Carter, Bottema-Beutel, Harvey, & Gustafson, 2015). Therefore, we recommend that transition researchers and practitioners continue to build effective strategies toward supporting young adults with severe disabilities through social networks while in school, given the influence community participation and engagement have on postschool outcomes.

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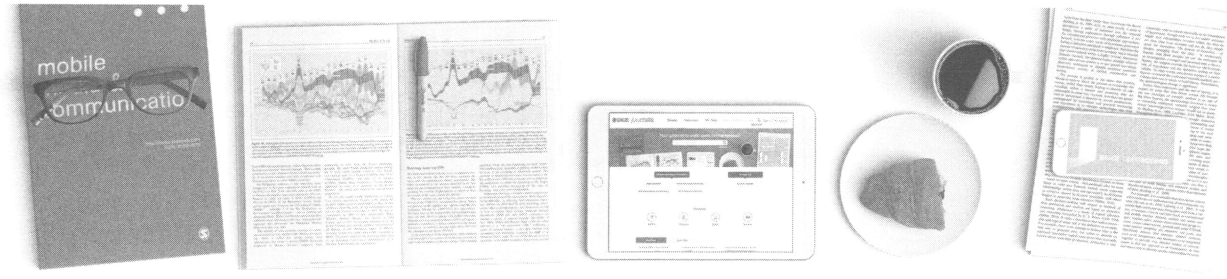

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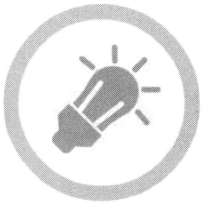

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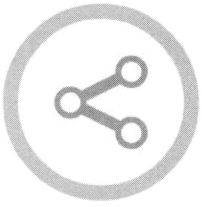

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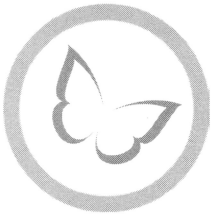

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SAGE Publishing

Research and Practice for Persons with Severe Disabilities

AUTHOR GUIDELINES

Purpose. *Research and Practice for Persons with Severe Disabilities (RPSD)* is a quarterly journal published by TASH (formerly The Association for Persons with Severe Handicaps) that addresses issues and concerns relating to or relevant for persons with severe disabilities across the lifespan. *RPSD* publishes articles that report original research; comprehensive literature reviews; analyses of policy; conceptual and practical position papers that offer new directions; and descriptions and examinations of innovative practices, programs, and models of service delivery.

Types of Articles Published in *RPSD*. The journal primarily publishes six types of articles.

Original Research Studies, include experimental (group comparison and single case), quasi-experimental, descriptive, correlational, qualitative, and mixed methods designs. *Length:* **25-35** double-spaced pages, including abstract, references, tables, and figures.

Literature Reviews, provide a systematic review of a body of literature. *Length:* **25-35** double-spaced pages, including abstract, references, tables, and figures.

Policy Analyses, provide a critical analysis of policy issues. *Length:* **25-35** double-spaced pages, including abstract, references, tables, and figures.

Brief Reports, include, but are not limited to, data-based descriptions of innovative practices, curriculum evaluation reports, replication studies, reports on personnel preparation programs, and time series case studies. *Length:* **12-15** double-spaced pages, including abstract, references, tables, and figures.

Exchange, presents reader perspectives on important issues in the field related to research and practice (e.g., current controversies, new developments), responses to articles published in *RPSD* and other sources, and personal experiences as a participant in the disability field. Perspectives from all *RPSD* readers are encouraged (e.g., self-advocates, family members, teachers, researchers, policy-makers). *Length:* **12-15** double-spaced pages, including abstract, references, tables, and figures.

Book Reviews, discuss the content and perspective of a book in relation to critical developments in the field. Book reviews are solicited by invitation only; however, persons interested in completing such a review may contact the editor. Publishers wishing to submit a book for possible review need to send two copies to the editor. Only current year books are reviewed. *Length:* **6-10** double spaced pages.

Writing for *RPSD*. Manuscripts written for *RPSD* should focus on persons with severe disabilities (i.e., individuals with significant and ongoing support needs) and include implications for research and practice that are relevant to persons with severe disabilities. Although manuscripts may address a broader population that extends beyond individuals with severe disabilities, there must be clear and distinguishable findings reported for individuals with severe disabilities. *RPSD* emphasizes ecological and educational validity in the content of the journal. Applied research conducted in natural, inclusive settings is likely to be more relevant to our readers than research conducted in highly artificial, controlled, and segregated settings. Authors are encouraged to provide evidence of research methods that adhere to quality indicators for research (e.g., see *Exceptional Children*, 2005, v. 71, no. 2). In addition, research involving human subjects should include a statement within the method section that confirms IRB approval was obtained prior to conducting the study.

Manuscript Preparation. All manuscripts should be prepared in accordance with the guidelines specified in the *Publication Manual of the American Psychological Association* (APA, 6th edition, 2010).

Format. Manuscripts should be typed, double-spaced, on 8 ½ X 11 inch paper, with 1-inch margins, and Times New Roman 12 point font. Tables may be single or double-spaced. A separate file should be created for each of the following: a) title page, b) abstract, main document, and references, c) tables, and d) figures. Files should be saved in Microsoft Word and should not contain any author-identifying information.

Artwork. Figures must be production-ready. Rules/tick marks should not be smaller than 1 point. Use bold type that is large enough to be reduced. Acceptable electronic formats for artwork include TIFF, JPEG, PNG, EPS, PDF, PPT, Excel, and Word. Scans/photos must be at least 300 dpi. At lower resolutions these items will have a very poor print quality even if they look crisp and clear on a printout.

Permissions. Written permission to reprint or adapt figures, tables, artwork, and other material from another source must be obtained prior to publication of an article. The author is responsible for obtaining permission and paying any fees assessed by the copyright holder.

Language. Reference to individuals with disabilities should conform to the General Guidelines for Reducing Bias described in the APA manual (2010). All *RPSD* articles will be edited to adhere to TASH policies on language, which are available from TASH Executive Offices: TASH, 2013 H Street NW, Washington, DC 20006; Phone: 202-540-9020; Email: info@tash.org

Statement of Ethics. The opinions expressed in the journal are those of the authors and do not necessarily represent those of the editor, editorial board, TASH Board of Directors, and the TASH Staff. Authors are encouraged to be respectful of all authors they cite or persons to whom they refer, and are advised not to reveal any personal information about these persons that is damaging or hurtful.

Manuscript Submission. Manuscripts should be submitted electronically through the online submission system, SAGE Track. Please go to journals.sagepub.com/home/rps and click on "Submit Paper" to find author guidelines and submission instructions. Questions regarding the submission process may be directed to Stacy Dymond, Editor, at sdymond@illinois.edu or via telephone at 217-244-9763.

Review Process and Editorial Decision. Manuscripts submitted to *RPSD* are screened to determine a) appropriateness for the journal, b) conformation to APA guidelines, and c) adherence to page limits. If a manuscript meets these criteria, the editor assigns the manuscript to an associate editor who becomes the editor-in-charge (EIC). The EIC sends the manuscript out for blinded review to two to three editorial board members, each of whom is selected for their particular expertise. A guest reviewer may also be invited to review the manuscript. Once all reviews have been returned, the EIC makes a decision about the manuscript taking into consideration the feedback from the reviewers, the EIC's own assessment of the manuscript, and the perceived importance, timeliness, and contribution of the manuscript to the field of severe disabilities. Decisions include: (a) publish, (b) publish with revisions, (c) do not publish/invite revisions, and (d) do not publish. The editorial decision is communicated to the corresponding author along with a summary that supports the decision. The review process takes from 3 to 4 months. Manuscripts accepted for publication are published ahead of print on SAGE Online First.

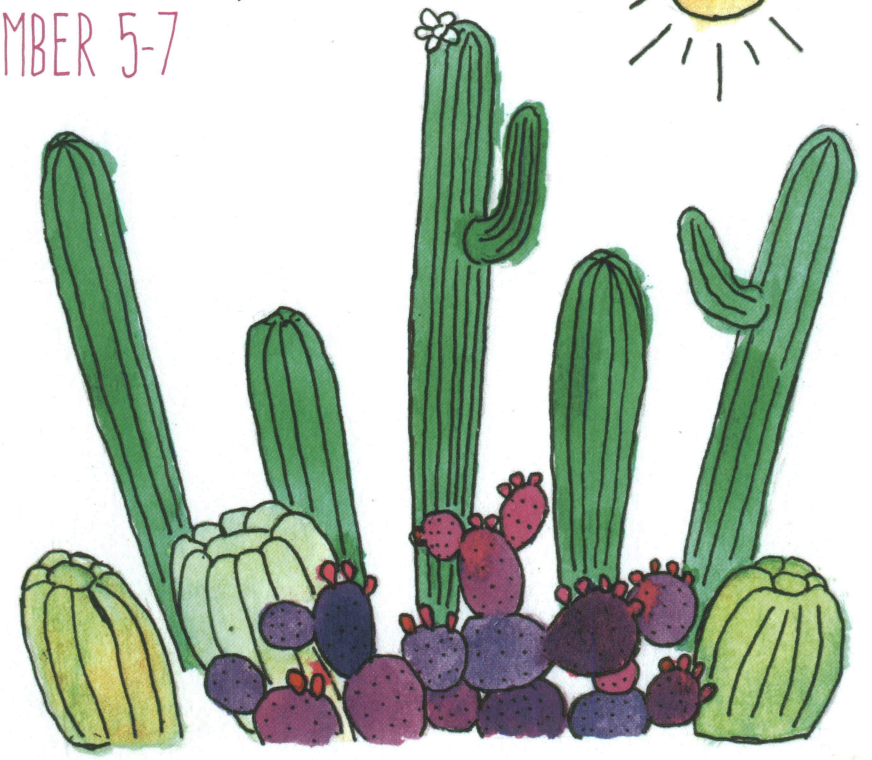
Additional Information. Any correspondence, queries or additional requests for information on the manuscript submission process should be sent to the *RPSD* editorial office as follows: Stacy Dymond, Department of Special Education, 1310 S. Sixth Street, 288 Education Building MC-708, Champaign, IL 61820; telephone: 217-244-9763; email: sdymond@illinois.edu

SAVE THE DATE

2019 TASH CONFERENCE

PHOENIX, AZ

DECEMBER 5-7



The TASH Conference brings together self-advocates, family members, advocates, professionals, researchers, providers and other allies to gain information, learn about resources, and connect with others across the country to strengthen the disability field. This year's confer¬ence theme, "Building Diverse and Inclusive Communities," reminds us that equity, opportunity, and inclusion relies on the input of broad perspectives and experiences.

Early-Bird Registration deadline is Friday, September 6, 2019.

WWW.TASH.ORG/CONFERENCE2019

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